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FEDERAL AVIATION

ADMINISTRATION

**FINAL REGULATORY EVALUATION, REGULATORY
FLEXIBILITY DETERMINATION, TRADE IMPACT
ASSESSMENT, AND UNFUNDED MANDATES ASSESSMENT**

**Certification of Airmen and
Aircraft for the Operation of Light-Sport Aircraft**

**Final Rule
(14 CFR Parts 1, 21, 43, 45, 61, 65, and 91)**

**OFFICE OF AVIATION POLICY AND PLANS,
OPERATIONS REGULATORY ANALYSIS BRANCH, APO-310**

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EXECUTIVE SUMMARY

This rulemaking action addresses gaps in the existing ultralight regulation in response to several petitions for rulemaking and for exemptions from existing regulations. The intended effect of this action is to provide for the manufacture of safe and economical light-sport aircraft and to allow operation of these aircraft by the public in a safe manner.

From 2004 to 2013, the total cost of the rule will be approximately \$221.0 million (\$158.4 million, discounted). The total cost of the rule consists of private sector costs and government costs. Private sector costs will be approximately \$202.0 million (\$144.5 million, discounted), of which \$139.5 million (\$98.9 million, discounted) represent the out-of-pocket costs. Government costs will be approximately \$18.9 million (\$13.9 million, discounted).

The FAA expects this rule to provide two major benefits. The first is increased safety in the operation of small simple aircraft identified in the rule as light-sport aircraft. Increased safety will result in a reduction of the number of future accidents that otherwise could occur, with their accompanying fatalities, injuries and property damage. The second benefit is the expansion of sport and recreational aviation operations of light-sport aircraft. This rulemaking will enable sport and recreational aviation to be more accessible and affordable while providing an environment in which safe, light-sport aircraft can be manufactured, properly maintained and safely operated. The FAA estimates that the potential benefits fall within the range of \$85.3 million (the set of preventable NTSB accidents) and \$325.4 million (the set of preventable NTSB accidents and the preventable association accidents). The discounted benefits range between \$57.7 million and \$220.3 million.

The final rule will not have a significant impact on a substantial number of small entities and will not constitute a barrier to international trade. In addition, the final rule does not contain any Federal intergovernmental or private sector mandates; therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

I. Introduction

The FAA is creating a new rule for the certification, operation, maintenance, and manufacture of light-sport aircraft. This action is necessary to address gaps in the existing ultralight regulation, and in response to several petitions for rulemaking and for exemptions from existing regulations. The intended effect of this action is to provide for the manufacture of safe and economical light-sport aircraft and to allow operation of these aircraft by the public in a safe manner.

II. Background

Several FAA regulatory initiatives have, in the past, addressed sport and recreational general aviation needs:

- Regulations regarding ultralight vehicles were issued under 14 CFR part 103 (47 FR 38776; September 2, 1982),
- Recreational pilot certificate were created under 14 CFR part 61 (54 FR 13028; March 29, 1989), and
- A new category of aircraft, primary category, was established under 14 CFR part 21 (57 FR 41367; September 9, 1992).

Part 103 was adopted in response to existing and rapidly growing hang glider activity. It defines an ultralight vehicle as either an unpowered or powered vehicle with certain weight, speed, and other limitations. A powered ultralight vehicle can carry only one occupant and can only be used for sport and recreational purposes. It does not have a U.S. or foreign airworthiness certificate and is not subject to the aircraft certification requirements of 14 CFR part 21, the maintenance requirements of 14 CFR part 43, the identification and marking requirements of 14 CFR part 45, or the registration requirements of 14 CFR part 47. Ultralight vehicle operators must comply with certain operating restrictions. Generally, these vehicles can only operate between sunrise and sunset; they must yield the right-of-way to all aircraft; they may not operate over

congested areas or over any open air assembly of people, and may not operate for compensation or hire. However, to operate one of these vehicles, the operator does not need to comply with the airman certification requirements in 14 CFR part 61, medical certification requirements in 14 CFR part 67, or the operating rules in 14 CFR part 91.

The 1989 amendment to part 61 that created the recreational pilot certificate was intended to be a lower cost alternative to the private pilot certificate. A recreational pilot certificate would be attractive for persons interested in flying basic, experimental, or homebuilt aircraft. A recreational pilot may only operate a single-engine airplane or rotorcraft certificated for no more than four occupants (but restricted to carrying no more than one passenger). This airplane may have a powerplant of no more than 180 horsepower. A recreational pilot is not only subject to the limits of a private pilot, but also to additional limits including not being permitted to tow an object; to fly between sunset and sunrise; to fly above 10,000 feet MSL or 2,000 feet AGL, whichever is higher; to fly without visual reference to the surface; or to operate in airspace in which the pilot needs to communicate with air traffic control (ATC).

In 1992, the FAA established a new category of aircraft, primary category aircraft because of concerns about the decline in general aviation activity in the United States. This decline was in part due to higher certification costs for aircraft. The new category had simplified procedures for type, production, and airworthiness certification. Primary category aircraft must be unpowered or have only a single, naturally aspirated engine. These aircraft are also subject to speed, weight, and load limits. They may not be used to carry persons or property for hire, although under certain conditions they may be rented or used for flight instruction.

Unfortunately, these rules have not achieved the FAA's regulatory goals. Action is now necessary to increase safety, to address advances in sport and recreational aviation technology, to eliminate gaps in the existing regulations, and to address several petitions for rulemaking and for exemptions from the existing regulations. Since the regulations were issued, the state of the art in ultralight vehicle technology has improved. These

improvements include light-engine technology and reliable, more effective application of low-speed aerodynamic principles, and new materials.

Although part 103 covers ultralight activities, an increasing number of ultralight vehicles were being granted exemptions and were operating outside the current regulations, because these vehicles either exceed the part 103 ultralight weight limit (254 pounds) or because they have two seats and an engine, or exceed both of these applicability limits.

On August 30, 1993, the FAA formed an Aviation Rulemaking Advisory Committee (ARAC) Part 103 (Ultralight Vehicles) Working Group (58 FR 47172, September 7, 1993) to review part 103 and to make a recommendation to the FAA concerning whether new or revised standards were appropriate. The ARAC initially recommended that part 103 should remain intact and the related exemptions should be continued. The ARAC also concluded that the primary category aircraft adopted in 1992 by the FAA was sufficiently flexible to allow the certification of many aircraft under consideration by the ARAC membership. ARAC also supported the continued use of exemptions but saw the potential for future regulatory action. The ARAC stated that the recreational pilot certification requirements of part 61 did not accommodate the scope of operations for persons seeking to fly a wide variety of small, slow, single and two-place aircraft.

On June 16, 1995 (60 FR 33247, June 27, 1995), the FAA revised its task for the ARAC to broaden its scope and the final ARAC recommendations called for a new regulation under part 61 to create a new “sport pilot” certificate, a self-evaluation medical certification and a self-initiated aircraft certification submittal to the Flight Standards Review Board (FSRB). The ARAC working group submitted its recommendations to the FAA for review in July 1998.

On January 25, 2002 (67 FR 5367, February 5, 2002) the FAA issued a Notice of Proposed Rulemaking (NPRM) addressing three major issues:

- Certification of light-sport aircraft;

- Certification of pilots and flight instructors to operate light-sport aircraft; and
- Certification of repairmen to maintain light-sport aircraft.

This final rule will modify the NRPM in various ways. After incorporating changes, the final rule will reflect that light-sport aircraft will include airplanes, powered parachute aircraft, and weight-shift control aircraft. Light-sport aircraft are limited to a maximum of two occupants, a 1,320-pound (600 kilograms) takeoff weight, a 45-knot stall speed, a 120-knot maximum operating speed, a single engine, and fixed landing gear. They may be used for sport and recreation, and a special light sport aircraft may be used for flight training or rental for compensation or hire.

The FAA currently issues two types of airworthiness certificates – standard and special. This rule adds light-sport category to the existing six categories under the special airworthiness certificate. Experimental light-sport aircraft are included under the special airworthiness certificate. The FAA currently issues an experimental certificate for eight purposes. This rule will add a new purpose under experimental – to operate light-sport aircraft.

Only complete, “ready-to-fly” light-sport aircraft that are built to the consensus standards will be eligible for a special airworthiness certificate in the light-sport aircraft category. Imported light-sport aircraft may also be eligible for a special airworthiness certificate if they meet the consensus standards or equivalent and the requirements specified in the rule that all light-sport category aircraft must meet. Light-sport aircraft not meeting the consensus standards may still be eligible for the experimental certificate.

There will be three ways to get an experimental certificate for the purpose of operating light-sport aircraft. First, a light-sport aircraft that does not meet the existing definition of ultralight vehicle will be eligible for an experimental certificate. Second, a light-sport aircraft previously issued a special airworthiness certificate and the operator does not want to comply with the operating limits associated with a special airworthiness certificate will be eligible to apply. Third, an aircraft assembled from a kit will be eligible for an experimental certificate. Conditions of use will vary between these 3 categories of light-sport aircraft operating under an experimental certificate.

The new sport pilot certificate will be established with training, experience, and testing requirements commensurate with the privileges and limits associated with this certificate level. This pilot certificate will fall between the part 103 regulations that address ultralight pilot privileges and those that address the recreational pilot certificate in part 91. Two of the key privileges a sport pilot will be granted are (1) the ability to operate a simple non-complex light-sport aircraft that exceed the limits of part 103 and (2) the permission to carry a passenger in this light-sport aircraft for sport and recreation.

Certificating light-sport aircraft repairmen will ensure that repairmen have the necessary skills to inspect (or maintain) light-sport aircraft and certify that they are safe to fly, receive FAA's aircraft-specific safety and training information, and report faults or failures to the FAA and light-sport aircraft manufacturers. This would improve how light-sport aircraft manufacturers correct faults and make a safer product.

III. Economic Comments

This section addresses commenter's concerns with the NPRM that were relevant to the costs or benefits of the rule. Sections that commenters felt would have economic impacts include: 21.186, 21.191(i), SFAR 89, Section 15, Section 55(g), Section 73(a), Section 93, Section 153, 65,107, Part 103, Part 183. The comments that are addressed include those that were submitted to the docket during the comment period and those that were submitted to the on-line public forum.

Provision 21.190 Issue of special airworthiness certificates for light-sport category aircraft

Several issues surfaced in the comments on this section. Several were concerned with the cost of special light sport aircraft. Some were concerned that one could not know what the costs of a light-sport aircraft will be until the consensus standards are developed.

Some were concerned with the costs of transporting manufactured aircraft from the manufacturer to the dealer or to the customer.

Several commenters expressed concern that newly manufactured light-sport aircraft eligible for the special airworthiness certificate would be very costly. Commenters cited costs ranging from \$30,000 to \$60,000 per aircraft. One commenter indicated that different manufacturers have said that it would cost \$30,000 to \$50,000 for a Special Light Sport Plane, with one manufacturer claiming costs could be as high as \$60,000. Another commenter said that a poll of manufacturers and other reliable sources indicates that the purchase price will range from \$32,000 to \$65,000. One commenter thought the price could go as high as \$70,000. A commenter voiced concern that a light-sport aircraft would cost more than an ultralight because the manufacturers would have to conform to the consensus standards, maintain a system of quality assurance, adopt a means of promulgating service bulletins, create a Pilot's Handbook, test fly the aircraft and publish specifications, accept greatly increased liability exposure, and since the aircraft is ready to fly, it would have to be flown or trucked across the country rather than shipped in a crate as are most ultralights. Another commenter also mentioned the additional costs of ferrying the trainer from the factory to the owner's airfield.

FAA Response: The FAA agrees that light-sport aircraft with a special airworthiness certificate will cost more than current ultralights. However, the special light-sport aircraft would be a certificated aircraft, whereas an ultralight is not certificated, nor do ultralights conform to a consensus standard. It is because of these certification and design differences it is expected that a light-sport aircraft would cost more than an ultralight vehicle.

The FAA also spoke with manufacturers and consulted prices on manufacturers' websites. Manufacturers indicated that a new factory built special light-sport aircraft would range in cost from \$15,000 to \$65,000. However, \$65,000 would be the cost of an upscale vehicle with many options that can be added if the buyer chooses to have them on

his or her light-sport aircraft. FAA discussions with manufacturers¹ indicate that basic training vehicles would range in price from about \$15,700²³ for a weight shift control vehicle to \$26,000³ for an airplane with a speed greater than 87 knots.

The commenters are correct that flying or trucking a factory-built aircraft will add to the cost of the aircraft relative to shipping it in a crate as is done for kit-built aircraft. This concern should only be relevant to instructors because they will be required to replace their experimental vehicles after 60 months with factory built trainers if they wish to continue training. This rule does not affect other owners of ultralights and will not require them to replace their vehicles with factory-built aircraft. The FAA agrees that having to truck or fly a factory built vehicle will add to the cost of the vehicle relative to purchasing a kit-built vehicle. This is part of the cost of flying a safer aircraft.

One Commenter stated that a light sport aircraft will be far more expensive to buy and maintain than an ultralight and that therefore price sensitive ultralight pilots would drop out of flying rather than pay for an expensive light-sport aircraft.

FAA Response: Ultralight pilots would still be able to fly the less expensive ultralights. If they are currently flying a two seat ultralight under the training exemption they would even be able to continue to fly that as long as they got it registered and certified within the required time period and did not use it for training for compensation and hire five years after the date of the final rule.

The consensus standards caused some concern amongst commenters. One commenter stated that until the consensus standards are in place, no one will know if a special light sport aircraft can be built for a reasonable amount. The commenter said that if the consensus standard required a type certificated engine, then the cost would be prohibitive. For example, a Weight-Shift Trainer with a 503-Rotax engine can be bought for \$9,400. If the consensus standards required a type certificated engine, the Weight-shift aircraft would have to use the Rotax 912 since there are no type certificated 2 stroke engines.

¹ FAA teleconference with manufacturers on January 24, 2003.

² This is based on a comparable price for a foreign built aircraft that meets foreign certification standards.

³ Excluding shipping costs.

This would add \$12,000 to the price of the aircraft. The commenter requests that no conclusion be drawn about the program until all information is available and commenters have another chance to comment.

The commenter gave the example that the primary category FAA-certified Quicksilver GT-500 is \$6,000 more expensive than the identical ultralight version of the GT-500. The commenter expressed concern that many price sensitive pilots would drop out of flying rather than pay for a higher price vehicles. Another commenter believes that the uncertainty surrounding Sport Pilot and the consensus standard will cause instructors to postpone buying new aircraft and that this could bankrupt the current ultralight manufacturers who might not be able to weather the period between now and when the manufacturers can produce a conforming light sport aircraft.

FAA Response: Concerns that the price may be prohibitive because the consensus standards might require type-certificated engines are unwarranted because the rule would not require that the aircraft contain type certificated parts. It is doubtful that the manufacturers would use parts that would price them out of the market.

We understand the concern that the consensus standards have not been defined yet. However, manufacturers, the FAA and effected parties are currently working together to define the consensus standards and are close to defining a set of standards that they feel would be acceptable.

Many of the commenters felt that the cost of purchasing a special light sport aircraft would cause instructors, especially those who teach part-time, to discontinue teaching rather than to incur the costs of a new factory built aircraft. This issue is also addressed in the comments to provision 21.191(i) (1). One commenter cited an estimate that there could be up to a 90% drop in ultralight instructors due to this requirement. The commenter polled 32 Basic Flight Instructors (BFI's) out of which only 2 said they would expect to continue to offer flight instruction after the exemption period expires. Another commenter stated that BFI registrations indicate that the majority of active instructors are

part-timers with the implication that these instructors would not continue to teach when required to purchase a new certificated special light sport aircraft. He indicated that many BFI's operate 2 seat trainers that are certificated in their country of manufacture. It would be less costly to bring these trainers up to special light sport aircraft standards.

FAA Response: The FAA believes that the cost of new special light-sport aircraft will not necessarily be as high as suggested by the commenters. The FAA believes that the higher prices cited by the commenters may represent aircraft that have optional luxuries such as leather seats, air conditioning, CD players, carbon metallic brakes, etc, which are not required by the rule. The FAA did an analysis of prices available on various manufacturers websites and included current prices only for basic factory-built two seat vehicles (that fit the light-sport aircraft parameters). These prices averaged \$13,930 for a powered parachute, \$14,449 for a weight-shift control and \$27,165 for a faster airplane. The consensus standards are expected initially to add 15% to the price of such aircraft. One can estimate that under the rule the basic powered parachute would cost about \$16,020, the basic weight shift control about \$16,616 and the basic faster airplane about \$31,240.

The FAA also collected data from a teleconference meeting of manufacturers and was provided with the following estimates. The range of prices for ready-to-fly airplanes certified under light sport aircraft was estimated from \$20,000 to \$60,000 depending on engine used. Certified light sport trike prices were estimated from \$14,000 to \$35,000 depending upon engine used, and the estimated price of powered parachutes started at \$14,000.

Popular Mechanics also cited a range of price estimates on their website including a best guess cost of a least expensive factory-built airplane configuration of around \$30,000. Another Popular Mechanics article cites prices for Sport Pilot-eligible aircraft displayed at OshKosh included a fully assembled powered parachute called the Destiny Fusion at a price of \$16,300.

The FAA believes that commenters citing prices as high as \$60,000 may have been referring to prices of aircraft with luxury items that are not required in an instructional vehicle under the rule.

The US Hang Glider Association expressed concerns about the cost for a manufacturer to certify the unique aircraft that is used for towing hang gliders as light sport or experimental under the proposal. They cited one manufacturer who estimated that the cost to comply with the consensus standards and other certification requirements would likely add about \$6,000 to the cost of the aircraft. The manufacturer providing these estimates is one that produces several hundred units annually. However, the market for the particular towing aircraft is fewer than ten per year and the organization is concerned that manufacturers may find the cost to certificate under the proposal would not be justifiable given the limited market. Furthermore, the USHGA is concerned that because of the questionable availability of Special LSA and Experimental Kit-built LSA, that there might not be aircraft available to train tow pilots after the 24/36 month transition period.

FAA Response: The FAA disagrees with the estimate to certify a light-sport aircraft provided by this commenter because the FAA spoke with several industry representatives that provided lower aircraft certification estimates.

Provision 21.191(I) Operating light-sport aircraft.

Several commenters addressed the repercussions of this provision. They all expressed concern that an experimental certificate for existing ultralight-like aircraft could not be used conducting initial flight training beyond 3 years after the effective date of the final rule. The commenters all brought up the concern that flight instructors would be unable or unwilling to incur the costs (which some said could range from \$30,000 to \$60,000) of purchasing a new factory-built aircraft and would therefore no longer offer instruction. According to the comments many instructors teach part-time and would not find it worthwhile to incur the costs of purchasing a factory-built certificated ultralight trainer.

One commenter said that to afford the price of a new special light sport aircraft for training (with a low estimate of \$32,000) many instructors would have to increase rates by \$25 an hour to \$100 an hour beyond what the market could bear.

The commenters feel that many instructors would discontinue training because of the costs to purchase a new aircraft and this would have negative safety implications because as the market of ultralight instructors shrank more people would try to teach themselves and there would be more fatalities. One commenter said that people almost always take instruction within commuting distance of their homes and few could afford to take a week or two off to travel to a flight school and stay until they can fly solo. Some refer to their belief that this would lead to pre-part 103 exemption conditions with costs from deaths, lawsuits, medical fees and administration of ignored government rules. Some recommended revising part 103 to include the ultralight instruction exemption or allowing some form of continued inspection for compensation for hire and rental after the three years.

FAA Response: The FAA has decided to extend the exemption period from three years to five years. Five years after the effective date of the final rule, instructors will only be permitted to offer instruction for compensation and hire in special light sport aircraft and not in experimental aircraft. The FAA does not think that the cost to purchase a basic trainer will be as high as some commenters indicated as was discussed in a response to earlier comments.

One commenter pointed out that the regulatory evaluation did not include the cost of acquiring and maintaining a new aircraft after the transition period. The commenter questions the FAA's suggestion that instructors could sell their current ultralight trainers to partly offset the cost of purchasing a new trainer, by pointing out that the cost of certificating existing trainers as experimental light sport aircraft is unknown and manufacturers have revealed ambivalence about assisting current owners in obtaining aircraft certificates.

FAA Response: The FAA acknowledges that the regulatory evaluation did not include the costs that current flight instructors would incur after the transition period of acquiring a new certified special light-sport aircraft to use for flight training for compensation and hire. The FAA has included these costs in the final regulatory evaluation. As for the questions on the plausibility of selling existing trainers, the owner can sell the aircraft as an experimental light-sport aircraft. The FAA has recently updated its data and estimates that the cost of an airworthiness inspection and certification for an existing aircraft would range from \$350 to \$650 depending on whether or not the aircraft was inspected during a workshop sponsored by the trade associations. Manufacturers would not have to assist current owners in obtaining airworthiness certificates for these experimental light-sport aircraft. The owner of the aircraft could then sell it to any person who wanted to operate the experimental light-sport aircraft. The FAA believes that there will be a market for these experimental light-sport aircraft.

The previous commenter also disagreed with the FAA's suggestion that some GA flight schools might be interested in adding a sport pilot training course to their curriculum. The commenter refers to a poll of a half dozen flight schools in Southern California where none of the participants were interested in adding a sport pilot course.

FAA Response:

The commenter is probably correct about many GA flight schools initially not being interested in providing sport pilot flight instruction. However, the FAA still expects that flight schools devoted to training sport pilots will emerge throughout the country as a result of this rule. In time, the FAA expects that some GA flight schools will also start offering sport pilot flight instruction.

SFAR No. 89 Sport Pilot Certification

One commenter indicated that while in general the changes will be good for safety, the price of flying will dramatically increase as equipment, training and maintenance will become more expensive.

FAA response: The FAA agrees that flying a new special light-sport aircraft will be slightly more expensive than flying a to-place ultralight trainer, but many of the new requirements exist today when operated in accordance with the part 103 training exemptions. This is necessary for increased level of safety required to carry a passenger and provide flight training for compensation or hire.

Section 15: Must I hold an airman medical certificate?

Comment Summary: The FAA's desire to remove a financial barrier is without merit regarding the cost of a medical certificate. A 2001 FAA survey of AMEs with at least a 66% response rate indicates the average cost of a class three medical is \$66.69 (Federal Air Surgeons Bulletin, summer 2001 p.9). Annualized for those under forty, the cost is \$22.23 and \$33.35 for those over forty. This can hardly be considered a financial burden.

Comment Summary: The concept of using a state issued drivers license in lieu of a medical is an idea whose time has come. I waste several hundreds of dollars each time I need a medical to get documentation for conditions that do not affect my ability to drive, or fly.

FAA Response: The FAA concurs that, in the case of many applicants for airman medical certification, the cost of an AME examination is not cost-prohibitive. However, if the AME directs an applicant to undergo further testing beyond a standard physical, the cost to obtain a medical certificate can become much more expensive. Therefore, the FAA believes that in certain cases the requirement for a third-class medical could be considered a financial burden.

Section 55(g): What aeronautical experience must I have to apply for a sport pilot certificate for powered parachute category privileges.

One commenter believes the 20-hour requirement proposed in the NPRM would be an undue financial burden to potential powered parachute pilots and recommended decreasing the initial training hours required for powered parachute pilots to 10 hours of flight training with a specific number of flights similar to the requirements for private pilots with glider ratings. Another commenter believes that requiring 15 hours of dual time for powered parachutes was excessive and recommended 5 hours of dual time as a minimum requirement. He has known several student pilots who have been proficient without need for 15 hours of dual time. For powered parachutes he would like to see this changed to 5 hours of dual time for minimum requirements.

FAA response: The FAA has revised the 20-hr training requirement to 10 hours (which would be with an instructor) and has accepted the recommendation to also require a specific number of flights. The candidate must undergo 20 takeoffs and landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport. The FAA feels this change establishes training requirements that are more consistent with this type of aircraft. This approach parallels training requirements for balloons and gliders, which have a higher focus on the more critical take off and landing phase and set up requirements, rather than the enroute phase of the flight.

Section 73(a): What are my limits for the operation of light-sport aircraft?

Comment Summary: The proposal forces powered parachutes and weight-shift-control aircraft to install additional equipment per the part 91 minimum VFR equipment list, which is unnecessary for safe flight. This includes but is not limited to airspeed indicator (\$150), magnetic compass (\$100), ELT (\$200), and transponder (\$2,000).

FAA Response: The commenter may have misunderstood the proposed rule. The VFR requirement (under part 91.205) for an airspeed indicator and magnetic compass apply to

standard category U.S. airworthiness certificates. Powered parachutes and weight-shift-control aircraft are not standard category vehicles and therefore would not be subject to those equipment requirements. A transponder would be required only for pilots who choose to fly within Class B and C airspace. The pilot is not forced to install a transponder if the pilot does not fly within that airspace.

Section 93 - How do I obtain a sport pilot certificate if I do not hold a pilot certificate issued under 14 CFR part 61 but I have been flying ultralight vehicles under 14 CFR part 103?

Comment Summary: Requiring notarized copies of pilot records from ultralight organizations would be cost prohibitive for USUA, EAA, and ASC. Without a notary on staff, the organizations would have to pay roughly \$10 per notarization. The commenter suggests eliminating the requirement that an ultralight pilot's records be notarized and believes a copy of the pilot's registration card should be sufficient.

Another commenter asked why a copy of a pilot's flight record would have to be notarized and suggested eliminating the notary requirement that an ultralight pilot's records must be notarized by a national ultralight organization.

FAA Response: The FAA agrees and has changed the language to state that the pilot obtain a certified copy of his/her records from the FAA-recognized ultralight organization.

Section 153 What if I am only a registered ultralight instructor with an FAA recognized ultralight organization?

One commenter was concerned that the requirements to become a sport pilot would make it too expensive for ultralight instructors to transition to sport pilot instructors. The transition would require a \$300 to \$500 aircraft airworthiness inspection, two knowledge tests (\$200), flight tests with a designated pilot examiner (\$300), and an 80-hour

maintenance course to perform maintenance on the instructor's existing trainer (\$2,000). The instructor also would begin with zero hours in his or her logbook.

FAA Response: To obtain a flight instructor certificate with a sport pilot rating, a registered ultralight instructor with an FAA-recognized organization who has either a sport pilot certificate or a private pilot certificate will not have to meet the above experience requirements including flight time requirements and therefore will not have to start with zero hours in his or her logbook. The instructor candidates will be required to take one comprehensive knowledge test and the FAA has given credit for the Fundamentals of Instruction Test successful passed with the FAA-recognized ultralight organizations during the transition phase. With regard to the maintenance course, that is a requirement for obtaining a repairman certificate with a maintenance rating, which is not required to become a sport pilot instructor. The maintenance course is not mandated by the rule.

Provision 65.107 Repairman certificate (light sport aircraft): Eligibility, privileges, and limits

One commenter pointed out that the FAA makes no provision for issuance of inspector ratings to those who assemble their aircraft from kits similar to those inspection ratings currently issued to those who build their experimental aircraft under the 51% rule. This commenter and another suggest that those who assemble his or her aircraft from a kit should be allowed to perform annual inspections upon that aircraft.

FAA Response: An amateur-built repairman rating is issued to a builder who can prove that he or she built 51% of the aircraft. The amount of time to build an amateur built aircraft ranges from 2000 to 4000 hours. The time and skills that will be required to assemble a light sport aircraft will be significantly less than the time required to assemble aircraft under the 51% rule and the FAA believes will not be sufficient to allow the owner to learn to adequately inspect the vehicle.

In addition, if instructors wish to continue to maintain and inspect their own aircraft they would have to become repairmen and this would cost over \$5,000 and 80 hours of their time. The commenter feels that this cost is too high.

In the final rule the FAA changed the requirements for obtaining a repairman certificate with a maintenance rating to 120 hours for airplanes, 104 hours for weight shift control and powered parachutes, but for lighter than air aircraft and gliders the course hours will remain at 80 hours. The FAA estimates that the 120 hour course will cost about \$3000 which is significantly less than \$5,000 and even less than that which was estimated in the NPRM for an 80 hour course⁴. It may be cost effective for each instructor to take a maintenance course. If the instructor does not wish to devote up to 120 hours of time to training, the instructor has the option of procuring the services of a repairman to maintain and inspect the aircraft. However, the FAA estimates the cost of a 100-hour inspection may be \$250 to \$300 so it could be cost effective for the instructor to become a certified repairman. As for the necessity of requiring the course, the FAA feels that since the instructor is offering services to the public, that safety needs to be enhanced and that this requires a 100-hour condition inspection.

The commenter also suggests reducing the 80-hour training requirement for the repairmen certificate to 16 hours to reflect the simplicity of the aircraft. Experience working on these aircraft could be substituted for course work as demonstrated by practical tests.

The FAA disagrees that the requirement should be reduced to 16 hours because the owner will not have the same familiarity with the vehicle that the owner would have if he or she had assembled it. The 80 to 120 hour courses will also allow the certificate holder to perform maintenance and condition inspections on aircraft owned by others. Should the instructor wish to take the 80 – 120 course in order to continue to inspect and maintain

⁴ The FAA originally estimated the cost at \$3,600 given the assumption that instructors would expect to recover at least \$45 per hour (\$45 x 80 hours = \$3,600). However, since the instructor would likely be offering the class to several students at once the course could be offered for less than the original estimate.

his or her own aircraft, the instructor can defray the costs of the course by offering repairman services to others.

Part 103: Ultralight Vehicles

Commenters were concerned that the ultralight training exemption will be eliminated. One commenter maintains that if two-seaters are classified as Light-Sport Aircraft the cost to buy, own, operate and insure them would be no different than general aviation. The commenter claims that instructors will have to train to the CFI level and register and insure their trainers at the current general aviation rate. The commenter is concerned that the rule would require taking someone who has experience in flying and instructing in ultralights, train him to the CFI level and not count his experience. The commenter reasons that insurance companies would then see that the instructor has zero experience and charge a higher premium.

FAA Response: The FAA does not agree that the rule will make the cost of purchasing, owning, operating and insuring light-sport aircraft the same as general aviation aircraft. First of all the estimated price of a new basic two-seat trainer produced under the consensus standards would be \$26,000⁵ (for one of the faster light-sport airplanes), which would be lower than the price of a comparable basic two-seat general aviation aircraft. For instance, the cheapest Cessna or Piper sells new for approximately \$160,000⁶. Second, the rule will not require sport pilot instructors to train to the CFI level. Rather a flight instructor with a sport pilot rating will be required to have a minimum of 150 hours (or less depending on the category and privileges) flight time experience as a pilot. A CFI requires at least 250⁷ hours flight time experience for the airplane flight instructor certificate. Furthermore, a member of an FAA-recognized ultralight organization will be allowed to credit experience and flight time towards the flight instructor certificate. Current flight instructors for ultralight vehicles will not be starting with zero hours in their logbook. Because the light-sport aircraft will be

⁵ Not including shipping costs.

⁶ "Flying for Fun: How ASTM Got Involved," Standardization News, Earl Lawrence, December 2002.

⁷ A CFI must have a commercial pilot certificate which requires a minimum of 250 hours flight time.

manufactured to an FAA accepted standard and pilots will receive training and pass practical and knowledge test standards, the FAA believes that the operator of a light-sport aircraft will obtain insurance at lower premium rates than would be available for ultralights which are not produced to a standard and may be piloted by operators who are not required to have training.

Another commenter was concerned over the cost of purchasing and certificating new aircraft, the perceived loss when selling current ultralight trainers no longer legal for training, the cost of obtaining sport pilot instructor ratings, and the increased cost of aircraft maintenance and inspection. This commenter indicated that many ultralight instructors would cease offering instruction and therefore make training less available, more expensive and less safe. They recommend renewing the 103 training exemption or incorporating it permanently into part 103.

FAA Response: The FAA does not wish to continue the training exemption because it is concerned about allowing aircraft that are not produced to a standard to be used for training. Also, the FAA believes that the commenter may be over-estimating costs for the reasons given to the previous commenters. The cost of a basic training vehicle is not expected to exceed \$30,000 as the FAA discussed in its response to earlier comments. Furthermore, those experienced instructors with an FAA approved ultralight trade organization will be allowed to credit their experience toward their instructor certificate with a sport pilot rating.

**Comments on the Regulatory Evaluation, Initial Regulatory Flexibility
Determination, Trade Impact Assessment, and Unfunded Mandates Assessment**

Some commenters criticized the benefits analysis accompanying the NPRM. Some questioned the selection of accidents for inclusion in the estimate of accidents that might have been avoided by the rule. One commenter points out that although the FAA claims to have analyzed the existing accident data there is no substantive qualified or detailed data presented that would allow the public to see that judgments made by the FAA result

from real causes. This commenter asks that the comment period be extended and the FAA was requested to make available all the raw data and qualifying documentation. One commenter asked that the data on ultralight accidents on which the FAA based its cost/benefit analysis be published since the commenter felt that it was not clear that as many lives would be saved as suggested or that the costs of accidents would be as high as stated. Another indicated that the FAA has no statistical data on the number of accidents.

The commenter further questions the use of “pilot error” as a causal factor for an accident that might be prevented by the rule. He maintains that pilot error cannot be attributed to a lack of training, but to a decision to act contrary to one’s training. As for the lack of proper day-to-day maintenance, the commenter points out that no amount of instruction can make a pilot do this and the NPRM will, at most, require the aircraft to be inspected annually. The commenter believes that many of the fatalities occurred because of a lack of proper pre-flight and ultralight pilots are aware of the need to make a proper pre-flight inspection. The rule cannot make a pilot perform a proper pre-flight inspection. The commenter concludes by saying that most of the fatalities could have been avoided if the pilot had acted in accordance with the training already received. He thinks the likelihood that the number of fatalities will drop significantly with additional training, better manufacturing quality control, or annual inspection is grossly overstated and suggests new numbers be prepared taking “pilot error” into account.

Another commenter called the FAA’s analysis of ultralight accidents completely meaningless. The commenter claims that the FAA has no idea what caused the ultralight accidents because neither the FAA nor the NTSB investigates ultralight accidents, and asked how the FAA can estimate that 82 out of 83 accidents could be prevented in response to the FAA’s stated belief that many of the accidents could have been avoided with the rule.

FAA response: The FAA acknowledges that insufficient explanation was provided of the criteria used to select accidents. The FAA has redone the benefit analysis with an

explanation of what data comprised the database of accidents and the criteria that were used to select accidents that might reasonably have been prevented by the rule.

Another commenter stated that the FAA estimated that a total of 82 fatalities could potentially be avoided by adopting the rule. The commenter went on to say that the FAA projected 83 fatalities over ten years. If this were so, according the commenter, there would be one fatality the first year and no fatalities the following nine years. The only other way the FAA could arrive at these figures would be to assume there would be a major increase in the number of people participating in the sport.

FAA Response: The FAA would like to clarify the analysis. For the NPRM the FAA compiled data on accidents of aircraft that would be defined as light-sport aircraft under the rule. The accident data came from the NTSB accident database, and the three FAA recognized ultralight organizations that hold an exemption to part 103 to conduct training in two-place ultralight vehicles. The FAA then selected accidents that it believes might have been prevented by the rule. It found 41 accidents that resulted in 51 fatalities that might have been prevented by the rule. The FAA then projected that 8 to 9 fatalities would be avoided by the rule every year except the first year when it assumed 5 fatalities would be avoided (because not all light-sport operators could comply with the rule the first year it was issued. This led to a total of 82 accidents that might be avoided by the rule.

One commenter stated that the FAA did not provide any analysis in regards to causal factors for any of the 36 accidents cited in the benefits section of the regulatory evaluation.

FAA Response: The FAA disagrees with the commenter on the issue of not providing any analysis in regards to causal factors for the accidents cited in the benefits section of the regulatory evaluation because in the appendices there are causal factors and a summary description given for each accident used in the regulatory evaluation.

Other commenters cite lack of data as a problem, since the NTSB does not regularly track accidents of ultralights and the FAA has no statistical data on the number of accidents in the ultralight community relating to pilot error, structural failure, maintenance, durability, or engine failure.

In a public forum several commenters also commented on the lack of accident data that was used throughout this NPRM and claimed it was not adequate enough to formulate a complete cost benefit analysis.

FAA Response: The FAA agrees with these commenters that not all fat ultralight accidents are reported to the National Transportation Safety Board (NTSB), Aero Sport Connection (ASC), Experimental Aircraft Association (EAA), or the U.S. Ultralight Association (USUA). The NTSB in particular only investigates accidents of registered aircraft, whereas the other organizations only report the accidents of their members, and are only required to report to the FAA accidents occurring in a two-place training vehicle operated under the part 103 training exemption they hold. Consequentially, if an accident was not reported anywhere, the FAA was not able to include it. One of the goals of this rule is to give the regulatory authorities the ability to better track accident data in order to make further safety enhancements when necessary.

The FAA has redone the benefit analysis and searched several databases for aircraft that fit the definition of a light sport aircraft and then applied a filtering technique to filter out those accidents that would not have been prevented by the rule. This methodology is described in detail in the regulatory evaluation and the results are presented there.

Some commenters pointed out that the number of accidents of GA aircraft far exceeded the number of ultralight accidents.

FAA Response: While the number of GA accidents far exceed the number of ultralight accidents we expect that there are far more hours spent flying general aviation aircraft than ultralights.

One commenter maintained that it is not clear who derives the benefits, and that it is not the manufacturers who will be bogged down by regulations and not the consumer who will be burdened by further training and licensing fees.

FAA Response: The FAA, in estimating lives that might be saved by the rule was estimating safety benefits to society at large.

Several commenters noted that the FAA indicated that certified pilots routinely receive notices of FAA safety programs and are eligible to participate in that supplemental training, they receive Notices to Airmen (NOTAMs), and are required to receive weather briefings when not operating in the vicinity of an airport and that these factors could be considered benefits of the rule.

A few commenters suggested the FAA use the ultralight organizations that are required to record their members addresses and phone number and use this information to disseminate NOTAM's, weather briefings, etc. Also, a commenter indicated that ultralight pilots may use their pilot registration number from the trade organization to obtain all weather related flight information including NOTAMS via telephone or Internet. In addition according to the current databases of the FAA, DOT and USUA there have been no ultralight incidents or accidents related to the disregard of NOTAM's.

FAA Response: The FAA feels that it can accomplish dissemination more effectively through its routine distribution of these notices. This will ensure that all certificated pilots operating certificated aircraft receive the same information provided through FAA approved sources. Many vendors and organizations representing ultralight pilots or general aviation pilots provide additional services to their members, making access to this information easier.

A few commenters stated that the benefits were underestimated due to a lack of reporting accidents and incidents by pilots who are not registered with the EAA, ASC, or USUA.

We believe that we may have originally underestimated benefits to the extent that the benefits of avoiding an accident should not only include averted fatalities but also injuries and/or damage to light-sport aircraft. We have decided for the regulatory evaluation to this final rule to quantify serious injuries and/or damage to light-sport aircraft. In estimating benefit values, the FAA is applying the value of \$580,700 for avoiding a serious injury. Additionally, we are valuing destroyed aircraft at their replacement cost, and aircraft with substantial damage at their restoration cost.

A few commenters felt that using the value of \$2.7 million as the cost of a fatality was extremely high and that the FAA should justify their position. A commenter believes that \$2.7 million, the value of a fatality avoided, is far too high. The same commenter believes that the math about 82 of 83 fatalities that will be prevented in 10 years is wrong.

FAA Response: The commenters should refer to the “Revised Departmental Guidance, Treatment of Value of Life and Injuries in Preparing Economic Evaluations,” Office of the Secretary of Transportation Memorandum, January 29, 2002. And/or the “Treatment of Value of Life and Injuries in Preparing Economic Evaluation,” Office of the Secretary of Transportation Memorandum, January 8, 1993. The Office of the Secretary of Transportation has increased the value of avoiding a fatality to \$3.0 million shortly after this NPRM was published/written. The updated value of averting a fatality will be used in the economic analysis of the final rule.

There was a math error in the NPRM regulatory evaluation and we have corrected the math error when we redid the analysis.

A second commenter claims that the government does good work when it comes to estimating deaths/accidents.

A third commenter believes that the benefits of the rule were underestimated.

Some commenters believe that the economic analysis underestimates the benefits of the proposal and that the rule might bring the onset of a new golden age of sport aviation.

FAA Response: The FAA followed routine procedure with respect to estimating the level of possible benefits to the public of avoiding accidents in which one or more individuals were either fatally or seriously injured. Also, the FAA has refined the benefits analysis after receiving suggestions during the comment period.

Commenters do not believe that the new proposal would do anything tangible to increase safety.

FAA Response: The FAA disagrees with these commenters. Safety may be defined in terms of reduction in the risk of death, personal injury, and property damage that results from air transportation accidents. The extent to which deaths, injuries and property damage resulting from preventable accidents would be reduced by this proposal represents a tangible benefit, and, therefore, it is valued in dollars.

Some commenters contend that registering light sport aircraft will improve accident reporting to the NTSB.

FAA Response: The FAA agrees with these commenters because not all accidents of unregistered vehicles are investigated.

Comment: Commenters believes that the FAA is overestimating the number of lives that will be saved with this new proposal.

FAA Response: The FAA has redone the benefit analysis to more clearly explain why certain accidents may have been prevented by the rule.

Data used in Regulatory Evaluation

One commenter stated that the FAA's assumption that 10% of the 10,000 fat ultralight operators will become sport pilot instructors is exaggerated. The commenter applied 10% to the current instructor base and hypothesized that 90% would become full time instructors to estimate there would be 280 full time instructors. The commenter used the current instructor base of 2,800 at the ASC, USUA and EAA for verification.

FAA Response: The FAA assumed that 10% of the estimated operators of ultralight-like aircraft would become flight instructors and the commenter suggests applying that percentage to the current instructor base. It is not clear why the commenter accepts the 10% but does not agree with applying it to the total existing number of ultralight-like aircraft operators. Based on information from the trade associations we do not believe that the estimate of 1000 instructors is exaggerated. In fact we have increased our estimate to 1,300 instructors currently providing instruction in these vehicles.

Several commenters stated that the FAA should not mix accident data for general aviation aircraft and ultralights (sport aircraft) because it distorts the data in some regards.

They suggested analyzing accident data for ultralights and general aviation aircraft separately.

FAA Response: The FAA feels the commenters misunderstood this section of the NPRM. The data has always been collected and analyzed separately and the FAA will continue this practice after implementation of the final rule.

Commenters believe that the safety of ultralight pilots will be compromised because training will be more difficult and expensive to obtain.

FAA Response: The FAA disagrees with these commenters. By requiring airworthiness certificates for light sport aircraft, and sport pilot and flight instructor certificates, deaths, injuries and property damage would be reduced.

Comment: a commenter believes that most ultralight accidents are not reported to the FAA because most are minor and cause no damage or injury (281).

FAA Response: The FAA did not consider accidents or events that cause no damage or injury. In this analysis the FAA used as a definition of an aircraft accident: an event associated with the operation of an aircraft in which any person suffers death, serious injury, or in which the aircraft receives substantial damage.

A commenter contends that the FAA is using the same statistics that were used to promote the recreational pilot rule.

FAA Response: The FAA believes that this commenter is referring to the Certification of Recreational Pilots and Annual Flight Review Requirements for Recreational Pilots and Non-Instrument-Rated Private Pilots with Fewer than 400 Flight Hours. In that rule, the FAA used general aviation accident statistics covering the period from 1972 to 1981 and forecast statistics covering the period from 1981 to 1991 to project future general aviation accidents in its cost-benefit analysis. In the proposed rule the FAA reviewed NTSB, ASC, EAA, and USUA accident data covering the period from 1995 to 2001. For the benefits analysis accompanying the sport pilot NPRM the FAA used light-sport aircraft accidents statistics, not general aviation statistics.

Several commenters believe that the cost numbers, affected pilots, and ultralights were overstated, whereas others believe just the opposite. A few commenters provided data, however, none of them provided any support for their data.

FAA Response: The FAA specifically requested that documented information in support of the commenters' cost data be supplied and none was supplied. Therefore, the FAA will continue to use data that is available to them.

When asked for comments on the data that the FAA used in its regulatory evaluation, the following comments were offered in an on-line public forum.

Pilot Estimates

A commenter indicated that of 1,400 existing ultralight flight instructors, only from 300 to 400 are actively instructing. The commenter believes that many flight instructors will stop instructing because they are required to get a new license to continue doing what they currently do. A second commenter believes that if the FAA does not place a "ton" of conditions on prospective instructors, there will be ample instructors available. According to a third commenter, the number of current pilots that will actually become sport pilot flight instructors is so low that it will cause more safety problems.

Several commenters believe that this rule will bring back thousands of pilots who stopped flying because of cost and because many pilots did not want to go the ultralight route. This rule will also bring in several new pilots that would not come on board under current rules. One of the commenters also believes that the rule makes it cost effective for non-pilots to get into the sport and then move up to GA and heavier more complex aircraft.

Three commenters do not believe that a great number of pilots would obtain repairman certificates.

A commenter believes that the number of new pilots is underestimated whereas a second commenter believes that it is accurate. Another commenter believes that the number of pilots that will resume flying would be in the thousands.

FAA Response: Based on information provided by FAA recognized ultralight organizations, the FAA estimates that there are currently 14,000 ultralight pilots and

1,300 ultralight flight instructors. The FAA assumed it will be cost effective for many pilots with a light-sport rating to obtain a repairman certificate with an inspection rating.

According to two commenters, the FAA has underestimated the cost of insurance. Another commenter believes that most of the economic impact of the rule will be due to insurance and liability.

FAA Response: The FAA did not estimate the cost of insurance because this data was unavailable.

According to a commenter, based on the 3-1 ratio of fixed wing current pilots to fixed wing certificated aircraft, at least 3,000 aircraft will need to be certificated in the first three years of the program. However, the DAR analysis of the FAA states that only 300 DARs per year will be impacted by this rule. The commenter indicates that it takes 40 man-hours to appoint a DAR (Designated Airworthiness Representative) and an additional 8 hours per year to supervise him or her. Forty man hours times 300 DARs plus 8 hours of supervision translates into 12,000 man hours initially, and 24,000 hours per year to maintain the DARs. The initial cost is 12,000 government man-hours the first year, and then 1,200 hours a year. At \$75/hour, this is an initial cost of up to \$900,000, rather than the stated cost of \$26,195, and an annual cost of \$90,000.

FAA Response: The FAA has revised its cost benefit analysis to include the cost of appointing DAR's. The FAA estimates that it will appoint 300 DAR's initially to handle the early influx of vehicles transitioning to sport pilot. These 300 DAR's will be needed in the first three years. After three years, only about 50 DAR's will be required. The costs of appointing, supervising and renewing DAR's is estimated in Table 35.

A commenter does not see much difference between the cost to become a private pilot and the cost to become a LSA pilot.

FAA Response: The FAA estimated that a sport pilot who is not a member of an FAA recognized ultralight organization will incur an average cost of \$3,505 for flight training including out-of-pocket and time costs while a private pilot will incur an average cost of \$9,891 for flight training including out-of-pocket and time costs.

A commenter believes that the FAA has overestimated the number of ultralights and BFIs, while it has underestimated the number of GA pilots who will become sport pilots, maintenance and associated training costs, and the costs to become a pilot.

FAA Response: The FAA has requested commenters to provide more accurate data, but the commenter does not provide it.

A commenter believes that if a powered weight shift trike currently priced at \$15K, is priced at \$35-40 K, SP will be dead on arrival.

FAA Response: FAA discussions with manufacturers have indicated that the price of a weight-shift control vehicle under the consensus standards will be around \$15,000.

A commenter believes that the rule will cause the current cost of a \$20,000 experimental aircraft to leap to over \$40,000.

FAA Response: Discussions with manufacturers have indicated that the cost of a basic two-seat training airplane that exceeds 87 knots will be under \$30,000.

The following comments were offered in a public forum

Two Commenters believe that there will be a push back from this regulation if it is left as stringent and complicated as it is.

A commenter does not believe that there will be a major surge in sport aircraft purchases including the repairman certificates.

A commenter believes that that if the current amateur-built experimental category and part 103 are left alone, the new rule would be improved.

A commenter believes that the number of powered parachutes will drop sharply.

The following comments were made in a public forum. The comments were in response to the question: Is the FAA's assumption of the average price of light-sport aircraft potentially impacted by the proposed rule accurate? No FAA responses are provided, because the question did not call for a response. These comments were statements, not questions.

Commenters Agree

A number of commenters agreed with the FAA's estimate or thought that the estimate was close or the best that could be made at this time. One indicated concern that excessive manufacturer's liability for U.S. companies would encourage the importation of foreign sport planes to the detriment of the U.S. aircraft industry because foreign manufacturers would not be concerned about lawsuits originating in the U.S.

One commenter thought some of the prices will go up, but in a competitive market prices will even out.

One commenter felt that if manufacturers do a proper job of design engineering and production quality control, the cost of complying with consensus standards and quality assurance should not add much to the cost.

According to one commenter, although manufacturers will incur additional paperwork costs, these costs can be incorporated in the selling price. The commenter acknowledges that safety cost money, however, it should also be kept in mind that manufacturers are trying to reach new young pilots, for whom the cost will be an issue.

Commenters Disagree

Many commenters indicated they did not think it was accurate.

Many indicated that the FAA's assumption of the average price of light-sport aircraft was too low. Some feel the price will be significantly higher than they are now. For instance, one of the commenters stated that presently he can buy any aircraft except a Rans in the range of 20K, while several manufacturers are quoting mid \$55 to \$65 K range. Another commenter feels that initially the price will spike, but will even out after ten years. Some commenters quoted prices around the \$50,000 level and another quoted a price of \$60,000 after polling manufacturers. Another quoted prices of approximately \$33,000 for the Quicksilver GT 500 and \$20,000 for the ultralight trainers. One thinks manufactured light sport aircraft will be more expensive to buy and maintain. The extra expense would include cost of liability insurance, and extra maintenance that may be required by manufacturers of engines/gear boxes and props. Another referred to a model that is currently sold for under \$40,000 ready made that estimates the same model will be sold for \$60,000 under the proposal. One commenter claims that the FAA estimates are pure fantasy because no one knows for sure what the consensus standards will be. This commenter was concerned that if the consensus standards include type certificated engines, the price of the aircraft could double. Another commenter states the cost for a fat ultralight to become a sport plane will be way too much because of the process of getting sport pilot certificate and getting a DAR to inspect the plane and issue an airworthiness certificate. Another commenter did not foresee much change in the price of new, prebuilt aircraft or kits. One spoke with a trike manufacturer who estimated his prices will more than double. Two commenters predicted that prices would increase by 60 – 120% as noted by manufacturers that are currently advertising such aircraft. Another commenter predicted that the price of the airframe will rise at least 60% while engine costs will rise 75%. Some commenters thought costs would be high because of the liability issue, certification costs, and less volume. Several commenters were concerned that the cost of manufacturer's liability was not factored in.

Some commenters either felt that it would be difficult to predict the price for such aircraft at this time or they had no data. Some indicated we would not know what the price will be until the consensus standards and airworthiness procedures are known.

IV. Analysis of Costs and Benefits

A. Major Assumptions

For the purpose of calculating the estimates of costs and benefits in this regulatory evaluation, the FAA has made the following general assumptions:

- Full compliance of those who are currently operating outside the Part 103 regulations or under a training exemption to Part 103.
- The rule is expected to take effect in 2004. The time horizon for this analysis is 10 years, 2004 through 2013.
- The number of sport pilots initially affected by the rule is estimated to be 14,000. About 7,000 existing sport pilots will come into compliance in 2004 and an equal number of pilots will come into compliance in 2005.
- The number of existing sport pilot instructors initially affected by the rule is estimated to be 1,300. About 700 existing sport pilot instructors will come into compliance with this rule in 2004 and 600 instructors will come into compliance in 2005.
- The number of new sport pilots is estimated to be 400 for each of the first two years. The number of new sport pilots will increase by 400 every two years, so by 2012 and 2013 there will be 2,000 new sport pilots each year for a total of 12,000 new sport pilots over ten years.

- The number of new sport pilot instructors is estimated to be 70 for each of the first two years (2004-2005). The number of new sport pilot instructors will increase by 20 every two years, so by 2012 and 2013 there will be 150 new sport pilot instructors each year for a total of 1,100 new sport pilot instructors over ten years. The new instructors will come from the existing sport pilots or new sport pilots from prior years.
- Each pilot and instructor will own one light-sport aircraft except that new instructors who will come from the pool of existing pilots or new pilots will purchase an instructional aircraft after becoming an instructor and will therefore own two light-sport aircraft if they are unable to sell their old light-sport aircraft.
- All monetary values are expressed in 2002 dollars.
- As required by the Office of Management and Budget (OMB), all present value calculations were done using a 7 percent interest rate.

B. Cost Analysis

From 2004 to 2013, the total cost of the rule is estimated to be approximately \$221.0 million (\$158.4 million, discounted) and out of pocket costs are estimated to be \$158.4 million (\$112.7 million, discounted). The total cost of the rule consists of private sector costs and government costs. Private sector costs will be approximately \$202.0 million (\$144.5 million, discounted) with out-of-pocket costs being approximately \$139.5 million (\$98.9 million, discounted). Government costs will be approximately \$18.9 million (\$13.9 million, discounted).

B.1. Identification of those Affected by the Rule

The following two sections list the individuals and/or entities that will be affected by the rule and describe how they will be affected.

B.1.1. Private Sector

Additional Assumptions

- All 14,000 pilots of unregistered ultralight-like aircraft must obtain sport pilot certifications, must have their aircraft inspected and certified, and must have their aircraft maintained by appropriately trained repairmen.
- Existing uncertified vehicles that fit the definition of light-sport aircraft will not be issued experimental certificates after [insert date 3 years from effective date of the final rule].
- Manufacturers of aircraft will produce special light sport aircraft certificated under 21.190, that adhere to manufacturer's consensus standards.
- New kit-built light-sport aircraft that are produced under consensus standards will have to be certified as experimental light-sport aircraft, under 21.191(i)(2).
- New factory built light-sport aircraft produced under consensus standards may be certified as special light-sport aircraft or as experimental light-sport aircraft.
- Current ultralight instructors operating under the Part 103 training exemption that receive a flight instructor certificate with a sport pilot rating and plan to continue flight instructing will have to replace their existing training aircraft within five years after the rule is enacted with a certificated special light-sport aircraft (21.190) in order to continue to offer training for compensation.
- Sport pilot organizations or some for-profit organizations will develop training courses for instructors with a sport pilot rating to purchase.

- Some existing aircraft will fit the definition of light-sport aircraft and anyone with a sport pilot certificate will be allowed to fly them provided they are only exercising sport pilot privileges. Under the current rules a private or recreational pilot certificate would be required to operate these aircraft.
- New sport pilot Designated Airworthiness Representatives (DARs) for light-sport aircraft will need to take a three-day training course in order to issue airworthiness certificates for light sport aircraft.
- New Designated Pilot Examiners (DPEs) for sport pilots will have to take a five-day training course in order to prepare them to examine sport pilots and sport pilot instructors.

B.1.2. Government

- The FAA will work with industry in developing and overseeing the consensus standards.
- The FAA will develop Advisory Circulars, orders, and articles for the light sport repairman course requirements.
- The FAA will develop and provide training programs for Designated Airworthiness Representatives, and Designated Pilot Examiners.
- The FAA will appoint, supervise and renew light-sport DARs, and Sport pilot DPEs.
- The FAA will develop practical test standards and knowledge test standards for prospective sport pilots and flight instructors with a sport pilot rating applying for certification.
- Each light-sport aircraft issued an experimental certificate or a special light-sport airworthiness certificate will be registered in the FAA Civil Aviation Registry.
- The NTSB will investigate accidents involving light-sport aircraft.

B.2. Private Sector Costs

B.2.1. Aircraft Inspection, Certification, and Registration

B.2.1.1. Rule for Aircraft Inspection, Certification, and Registration

The Sport Pilot Rule will utilize the special airworthiness certificate for light-sport category aircraft and the experimental certificate for other light-sport aircraft. (Note – Experimental does not apply to the light-sport category aircraft) The FAA will issue a special airworthiness certificate in the light-sport category to operate a special light-sport aircraft, other than a gyroplane, for sport and recreation, flight training, or rental. Part

21.190 of the rule will require that the aircraft meet the eligibility requirements including a manufacturer's statement of compliance for light-sport category aircraft. Light-sport aircraft meeting the requirements of part 21.190 will be issued a special airworthiness certificate. The aircraft can then be used for sport and recreation, flight training or rental. The special airworthiness certificate shows that the aircraft was designed and manufactured to the consensus standards developed by manufacturers and accepted by the FAA.

An experimental certificate for the purpose of operating a light-sport aircraft can be issued in three ways under provision 21.191. First, if a light-sport aircraft does not meet the existing definition of ultralight vehicle in part 103.1 and it has not been previously been issued an airworthiness certificate, it may be issued an experimental certificate under this provision. An application to register the aircraft must be submitted within the first twenty-four (24) months from the effective date of the rule and the aircraft must be inspected and issued an airworthiness certificate within the first thirty-six (36) months after the effective date of the final rule. Once the aircraft is issued an experimental certificate, the aircraft may be used for the purposes of sport and recreation, and flight training. Aircraft issued this type of experimental certificate will be allowed to be used for compensation or hire only while conducting flight training and only for a period of five (5) years after the effective date of the final rule.

Second, an experimental certificate can be issued for an aircraft assembled from an aircraft manufacturer's kit. These aircraft can be used for sport and recreation and the owner of this aircraft may receive flight training from a qualified instructor once issued this type of experimental certificate.

Third, if an aircraft was previously issued a special airworthiness certificate for light-sport aircraft, and if the owner no longer wishes to comply with the requirements of that certificate, the owner may obtain an experimental certificate for that aircraft.

Currently existing unregistered ultralight-like aircraft do not have airworthiness certificates because they don't qualify under any existing certificates criteria. Some are operating under a training exemption to part 103. Once the rule becomes effective all these vehicles will be required to obtain an experimental light-sport airworthiness certificates for their aircraft in order to keep operating. All new light sport aircraft will also be required to have airworthiness certificates, which can be either a special airworthiness certificate or an experimental certificate for light-sport aircraft and they will have to be registered.

Furthermore, the rule will require that instructors replace their existing vehicles used for instruction with a special light-sport aircraft no later than five years after the rule is finalized. This will result in instructors having to replace their aircraft sooner than they would without the rule.

B.2.1.2. Additional Assumptions for Aircraft Inspection, Certification, and Registration

- The FAA assumed a majority of light-sport aircraft manufacturers would experience a learning curve effect with respect to their increase in manufacturing costs due to compliance with the consensus standards during the first ten years following the publication of the rule and will be able to reduce their compliance costs of meeting the consensus standards as time progresses. The FAA assumes that the average price of a light-sport aircraft will increase by approximately fifteen percent during the three years of the rule, twelve percent the next three years, and by eight percent over the following four years, with respect to current costs.
- The FAA believes that some manufacturers will be better able to comply with the consensus standards than others. From 2004 through 2006 the FAA assumes that one third of the manufacturers will experience a fifteen percent increase, one third will experience a twelve percent increase, and one third will experience an eight percent increase. From 2007 through 2009 the FAA assumes that one third of the

manufacturers will experience a twelve percent increase, and two-thirds will experience an eight percent increase. From 2010 through 2013 the FAA assumes that all manufacturers will experience an eight percent increase.

- In the first year 25% of new light-sport aircraft will be factory-built and 75% will be kit-built; in the second and third years, half will be factory-built and half will be kit-built; and in all the subsequent years, 75% of new aircraft will be factory-built and 25% will be kit-built.
- If the aircraft is factory built, then the manufacturer will register the aircraft and have the \$350 cost of the airworthiness certificate built into the price. If the aircraft is kit-built or experimental, then the owner will register the aircraft and pay for the airworthiness certificate.

B.2.1.3. Analysis of Costs for Aircraft Inspection, Certification, and Registration

Certificating Inspection Costs

Over the next 10 years, the cost of light-sport airworthiness certification will be approximately \$17.1 million (\$12.7 million, discounted), as shown in Table 1. If an existing or new sport pilot (who is an association member), or instructor, purchases a kit-built light-sport aircraft, or would like to have their existing aircraft certificated, between 2004 and 2005, then they can take it to an association workshop and pay \$350 for the airworthiness inspection and certification. If an existing or new sport pilot, who are not members of an association, purchases a kit-built aircraft, or would like to have their existing aircraft certificated between 2004 and 2005, then they must arrange to get it inspected by a DAR for the airworthiness inspection and certification, and the inspection will cost \$650. For years 2006 through 2013 those who purchase kit-built aircraft will be charged \$650 because the workshops will no longer be available and each pilot must arrange to have a DAR inspect their aircraft. It is assumed that from 2004 through 2006 seventy-five percent of those existing and new pilots will take their aircraft to an

association workshop for their airworthiness inspection and certification, and the remaining twenty-five percent will have to make arrangements with a DAR. If a new or existing pilot or instructor purchases a factory built aircraft, then it is assumed by the FAA that the airworthiness inspection and certification would cost \$350.

In preparing this estimate the FAA assumed each pilot or flight instructor will own one light-sport aircraft and the useful life of these aircraft will be ten years. The FAA also assumed that ten percent of the existing sport pilot population (1,400) will replace their aircraft every year. The FAA also assumed that ten percent of the existing flight instructor population (130) will replace their aircraft every year for the first four years and that all remaining aircraft (780) will be replaced by the end of the first sixty months in order for them to continue to receive compensation for instructing new sport pilots.

Table 1. Cost of Light-Sport Aircraft Airworthiness Certification Inspections													
	Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H	Column I	Column J	Column K	Column L	Column M
Years	Number of Existing Light-Sport Aircraft Impacted	Number of Existing Light-Sport Replacement Aircraft Impacted	Number of New Light-Sport Aircraft Impacted	Number of New and Replacement Light-Sport Aircraft Impacted	Airworthiness Inspection Costs for Existing Light-Sport Aircraft	Airworthiness Inspection Costs for New or Replacement Kit-Built Light-Sport Aircraft ¹	Certification Costs for Existing, Replacement and New Light-Sport Aircraft	Number of Existing Instruction Aircraft Impacted	Number of New and Replacement Instruction Aircraft and Factory Built Aircraft Impacted	Airworthiness Inspection Costs for Existing Flight Instruction Aircraft	Airworthiness Inspection Costs for Factory-Built Aircraft	Certification Costs for Existing and New Flight Instruction Aircraft and Manufactured Aircraft	Total Cost
				B + C	.75A x \$350 + .25A x \$650		E + F			H x \$350	I x \$350	J + K	G + L
2004	5,600	1,400	400	1,800	\$2,380,000	\$637,500	\$3,017,500	570	500	\$199,500	\$175,000	\$374,500	\$3,392,000
2005	5,600	1,400	400	1,800	\$2,380,000	\$425,000	\$2,805,000	470	1,000	\$164,500	\$350,000	\$514,500	\$3,319,500
2006		1,400	800	2,200	\$0	\$393,250	\$393,250		1,815		\$635,250	\$635,250	\$1,028,500
2007		1,400	800	2,200	\$0	\$393,250	\$393,250		1,815		\$635,250	\$635,250	\$1,028,500
2008		1,400	1,200	2,600	\$0	\$566,800	\$566,800		2,618		\$916,300	\$916,300	\$1,483,100
2009		1,400	1,200	2,600	\$0	\$440,050	\$440,050		2,033		\$711,550	\$711,550	\$1,151,600
2010		1,400	1,600	3,000	\$0	\$508,300	\$508,300		2,348		\$821,800	\$821,800	\$1,330,100
2011		1,400	1,600	3,000	\$0	\$508,300	\$508,300		2,348		\$821,800	\$821,800	\$1,330,100
2012		1,400	2,000	3,400	\$0	\$576,550	\$576,550		2,663		\$932,050	\$932,050	\$1,508,600
2013		1,400	2,000	3,400	\$0	\$576,550	\$576,550		2,663		\$932,050	\$932,050	\$1,508,600
2004-2013					\$4,760,000	\$5,025,550	\$9,785,550			\$364,000	\$6,931,050	\$7,295,050	\$17,080,600
Present Value of Cost													\$12,708,387
Notes:													
1) Calculations for the Airworthiness Inspections Costs for New or Replacement Light-Sport Aircraft were obtained by multiplying 75 percent of Column C of Table 2A by \$350 and 25 percent of Column C of Table 2A by \$650 for years 2004 and 2005. For years 2006 through 2013 100 percent of Column C of Table 2A was multiplied by \$650.													
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003													

Cost of Consensus Standards

Over the next 10 years, the additional aircraft cost borne by sport pilots and new instructors due to slightly higher cost of manufactured light-sport aircraft under consensus standards, plus the cost of replacing some two-place ultralight-like training vehicles before they would be voluntarily retired will be approximately \$45.2 million (\$31.6 million, discounted), as shown in Table 2A. In preparing this estimate the FAA assumed each pilot or flight instructor will own one light-sport aircraft and the useful life of these aircraft will be ten years. The FAA also assumed that ten percent of the existing sport pilot population (1,400) will replace their aircraft every year. The FAA also assumed that ten percent of the existing flight instructor population (130) will replace their aircraft every year and that all remaining aircraft (780) will be replaced by the end of the first sixty months in order for them to continue to receive compensation for instructing new sport pilots. Some of the existing pilots will become flight instructors after the rule is published and will purchase a new factory built aircraft to be used for instruction purposes. They may also have the ability to sell their existing light-sport like aircraft to offset their costs for the new factory built light-sport aircraft. This analysis does not take into account the resale value of their existing aircraft and this may lead to an overestimation of the cost of this requirement.

Table 2A. Costs of Purchasing Aircraft that Comply with the Consensus Standards									
	Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H	Column I
Years	No. of New or Existing Sport Pilots Who Purchase a New Aircraft	No. of New or Existing Sport Pilots Who Purchase Factory Built Aircraft	No. of New or Existing Sport Pilots Who Purchase Kit Built Aircraft	Kit Built Aircraft ¹	No. of New or Existing Instructors Who Purchase Factory Built Aircraft	No. of New or Existing Instructors and Sport Pilots Who Purchase Factory Built Aircraft	Manufactured Aircraft ²	Cost of Replacing an Aircraft Before it Would Have Been Retired	Total Cost
			a - b			e + b			
2004	1,800	300	1,500	\$3,148,161	200	500	\$909,213	\$0	\$4,057,375
2005	1,800	800	1,000	\$2,098,774	200	1,000	\$1,818,427	\$0	\$3,917,201
2006	2,200	1,595	605	\$1,269,758	220	1,815	\$3,300,445	\$0	\$4,570,203
2007	2,200	1,595	605	\$1,015,807	220	1,815	\$2,640,356	\$0	\$3,656,162
2008	2,600	1,728	872	\$1,464,105	890	2,618	\$3,808,513	\$2,308,360	\$7,580,978
2009	2,600	1,923	677	\$1,136,696	110	2,033	\$2,957,489	\$0	\$4,094,186
2010	3,000	2,218	782	\$1,125,423	130	2,348	\$2,927,771	\$0	\$4,053,194
2011	3,000	2,218	782	\$1,125,423	130	2,348	\$2,927,771	\$0	\$4,053,194
2012	3,400	2,513	887	\$1,276,534	150	2,663	\$3,320,551	\$0	\$4,597,086
2013	3,400	2,513	887	\$1,276,534	150	2,663	\$3,320,551	\$0	\$4,597,086
2004-2013				\$14,937,215			\$27,931,089	\$2,308,360	\$45,176,664
Present Value of Cost									\$31,587,108
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003									
Notes:									
1) Average cost of a LSA + percent increase in the aircraft price to reflect the consensus standards.									
In calculating the cost of a LSA, the FAA did not use any of the options, other than engines, available on these aircraft because the FAA does not require them and did not feel they were necessary when calculating the minimum cost to purchase a light-sport aircraft. See Appendix C for details pertaining to kit built light sport aircraft.									
2) Average cost of a manufactured two place LSA + percent increase in the aircraft price to reflect the consensus standards. See Table 2B for cost calculations regarding manufactured two-place light-sport aircraft.									

Table 2B. Cost of Replacing Aircraft Before they would Have Been Retired			
	Column A	Column B	Column C
Years	No. of Existing Flt. Instructor/Aircraft Impacted ¹	Cost of Replacing an Aircraft Before it Would Have Been Retired ²	Total Cost
			Col. A x Col. B
2009	130	\$1,291	\$167,830
2010	130	\$2,498	\$324,681
2011	130	\$3,625	\$471,271
2012	130	\$4,679	\$608,270
2013	130	\$5,664	\$736,307
2009-2013			\$2,308,360
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003			
Notes:			
1) Flight instructors would be allowed to operate their aircraft for compensation or hire for a period of 5 years after the effective date of the final rule. At that time, they will be required to replace their two-seat LSA for one that is in accordance with the consensus standards.			
2) Year 2009: $\$19,734 \times (1-(1/1.07^1))$. Year 2010: $\$19,734 \times (1-(1/1.07^2))$. Year 2011: $\$19,734 \times (1-(1/1.07^3))$. Year 2012: $\$19,734 \times (1-(1/1.07^4))$. Year 2013: $\$19,734 \times (1-(1/1.07^5))$.			
\$19,734 = average cost of an existing trainer. In calculating the cost of an existing trainer, the FAA did not use any of the options, other than engines, available on these aircraft because the FAA does not require them and did not feel they were necessary when calculating the minimum cost to purchase a light-sport aircraft. See Appendix C for details			

The FAA estimated that the cost of replacing aircraft before that aircraft would have been retired will be approximately \$2.3 million (column H of Table 2A). The calculation of these costs are shown in Table 2B.

Registration Costs

§47.15(c) provides for issuance to a manufacturer, upon written request, enough identification numbers to supply this estimated production for the next 18 months. The FAA estimated the cost of complying with these requirements will be approximately \$9,000 (\$6,000, discounted), as shown in Table 3.

Table 3. Cost of Manufacturers Applying for a U.S. Identification Number						
47.15 (c)						
Year	# of manufacturers	Hours	Manufacturer wage_management	Manufacturer wage_clerical	Undiscounted Cost	Discounted Cost
2004	45	0.75	\$55.00	\$17.93	\$918	\$858
2005	45	0.75	\$55.00	\$17.93	\$918	\$802
2006	45	0.75	\$55.00	\$17.93	\$918	\$749
2007	45	0.75	\$55.00	\$17.93	\$918	\$700
2008	45	0.75	\$55.00	\$17.93	\$918	\$654
2009	45	0.75	\$55.00	\$17.93	\$918	\$612
2010	45	0.75	\$55.00	\$17.93	\$918	\$572
2011	45	0.75	\$55.00	\$17.93	\$918	\$534
2012	45	0.75	\$55.00	\$17.93	\$918	\$499
2013	45	0.75	\$55.00	\$17.93	\$918	\$467
2004-2013					\$9,179	\$6,447
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						

Section 47.15 sets forth the requirement to obtain an identification number for aircraft not previously registered (47.15 (a)(1), for aircraft previously registered in the U.S. 47.15(a)(2), and for aircraft previously registered in foreign countries 47.15(a)(3)). The FAA estimated the cost of complying with these requirements will be approximately \$573,000 (\$474,000 discounted), as shown in Table 4.

For purposes of this evaluation, the FAA assumes that existing sports pilots replace 10% of their aircraft each year with new aircraft and that new sport pilots buy new aircraft. Existing and new instructors always buy a factory built aircraft whenever they purchase a new aircraft. In the fifth year, 60% of the existing instructors are going to replace their aircraft with new aircraft. Forty percent of existing instructors have replaced their aircraft (through attrition) in the previous four years. The FAA also assumes that in the first year, 25% of all new aircraft will be factory built. In the second year, the FAA assumes that 50% of all new aircraft will be factory built, and thereafter, the FAA assumes 75% of all new aircraft will be factory-built. In any given year during the analysis period, the number of factory built aircraft purchased by sports pilots is always the number of factory built aircraft produced that year minus those purchased by the instructors. This cost was derived by multiplying the effected sport pilot population by three quarters of an hour to account for the time to fill out the application form multiplied

by their wage rate of \$31.50. The effected population will include those who will be registering their vehicles as experimental. This will include existing vehicles and new kit-built vehicles. Manufacturers of factory-built aircraft will apply for identification numbers for these aircraft under section 47.15(c). The same calculation was used for the instructor population, but with their wage rate of \$34.65.

Table 4. Cost of Obtaining Identification number for: Existing and Kit-Built Light-Sport Aircraft								
47.15 (a) (1), 47.15 (a) (2) and 47.15 (a) (3)								
Year	Existing Pilots who will register or replace their aircraft	New Pilots	Sport Pilot Purchased Manufactured Aircraft	Cost for pilots	Existing Instructors who are not replacing their aircraft with factory built aircraft	Cost for instructors	Undiscounted Cost	Discounted Cost
	a	b	c	(a + b - c) x .75 x (\$31.50 + \$5)	d	d x .75 x (\$34.65 + \$5)		
2004	7,000	400	300	\$194,363	570	\$16,950	\$211,313	\$197,489
2005	7,000	400	800	\$180,675	470	\$13,977	\$194,652	\$170,016
2006	1,400	800	1,595	\$16,562	0	\$0	\$16,562	\$13,519
2007	1,400	800	1,595	\$16,562	0	\$0	\$16,562	\$12,635
2008	1,400	1,200	1,728	\$23,885	0	\$0	\$23,885	\$17,029
2009	1,400	1,200	1,923	\$18,547	0	\$0	\$18,547	\$12,358
2010	1,400	1,600	2,218	\$21,421	0	\$0	\$21,421	\$13,340
2011	1,400	1,600	2,218	\$21,421	0	\$0	\$21,421	\$12,467
2012	1,400	2,000	2,513	\$24,295	0	\$0	\$24,295	\$13,215
2013	1,400	2,000	2,513	\$24,295	0	\$0	\$24,295	\$12,351
2004-2013				\$542,025		\$30,927	\$572,952	\$474,420

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Notes:

1) Column c coincides with column g in Table 29 for purposes of continuity.

2) To calculate the costs for pilots, we added the number of existing pilots who will register or replace their aircraft to the number of new pilots, then subtracted the number of sport pilots who would purchase manufactured aircraft. This total was then multiplied by their respective wage rate and by the time, in hours, to complete the form.

3) To calculate the costs for instructors we subtracted the number of new instructors from the number of existing instructors and multiplied their sum by the time, in hours, to complete the form and their wage.

Sections 47.31, 47.33, 47.35 and 47.37 set forth procedures for applying for a Certificate of Aircraft Registration. Section 47.31 requires that an applicant submit AC Form 8050-1 (Aircraft Registration Application), the original Aircraft Bill of sale or other evidence of ownership and a fee. Section 47.33 describes requirements that owners of aircraft not previously registered anywhere must meet. The person may register the aircraft if he complies with 47.3, 47.7, 47.8, 47.9, 47.11, 47.13, 47.15 and 47.17. The owner must also submit the aircraft Bill of Sale (AC Form 8050-2), an equivalent bill of sale or other evidence of ownership. If the owner cannot produce any of these documents, then the owner must submit other evidence that is satisfactory to the Administrator. The owner of an experimental light-sport aircraft must provide description information about the aircraft on AC form 8050-88 A (which is an affidavit of ownership for light-sport aircraft). Similarly, sections 47.35 states the registration

requirements for aircraft last previously registered in the United States and section 47.37 states the requirements for aircraft last previously registered in a foreign country.

The time cost of incurred by owners registering their light-sport aircraft may be found in Table 5. This cost was derived by multiplying the number of all light-sport aircraft (including replacement aircraft) by three quarters of an hour to account for the owner's time to fill out and submit the required information to register the aircraft. This is then multiplied by either the pilot or instructor wage rate depending on who is completing the paperwork. The FAA estimated the cost of the application process will be approximately \$941,220 (\$702,520 discounted), as shown in Table 5.

Table 5. Time Cost of Registering Aircraft New and Existing Light-Sport Aircraft										
47.31, 47.33, 47.35, and 47.37										
Year	# of new and existing pilot aircraft that will be registered	Hours	Pilot wage	Cost for pilots	# of existing and new instructor aircraft that will be registered	Hours	Instructor wage	Cost for instructors	Undiscounted Cost	Discounted Cost
2004	7,400	0.75	\$31.50	\$174,825	770	0.75	\$34.65	\$20,010	\$194,835	\$182,089
2005	7,400	0.75	\$31.50	\$174,825	670	0.75	\$34.65	\$17,412	\$192,237	\$167,907
2006	2,200	0.75	\$31.50	\$51,975	90	0.75	\$34.65	\$2,339	\$54,314	\$44,336
2007	2,200	0.75	\$31.50	\$51,975	90	0.75	\$34.65	\$2,339	\$54,314	\$41,436
2008	2,600	0.75	\$31.50	\$61,425	110	0.75	\$34.65	\$2,859	\$64,284	\$45,833
2009	2,600	0.75	\$31.50	\$61,425	110	0.75	\$34.65	\$2,859	\$64,284	\$42,835
2010	3,000	0.75	\$31.50	\$70,875	130	0.75	\$34.65	\$3,378	\$74,253	\$46,241
2011	3,000	0.75	\$31.50	\$70,875	130	0.75	\$34.65	\$3,378	\$74,253	\$43,216
2012	3,400	0.75	\$31.50	\$80,325	150	0.75	\$34.65	\$3,898	\$84,223	\$45,812
2013	3,400	0.75	\$31.50	\$80,325	150	0.75	\$34.65	\$3,898	\$84,223	\$42,815
2004-2013				\$878,850				\$62,370	\$941,220	\$702,520

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Sections 47.41 and 47.43 define the duration of the certificate, provide for the return of the Certificate of Aircraft Registration, to the FAA Aircraft Registry and define when the registration becomes invalid. Circumstances under which the registration must be returned include: when the aircraft is totally destroyed or scrapped or when ownership is transferred. The costs of fulfilling these requirements is estimated to be \$497,000 (\$349,000, discounted) over the next ten years as displayed in Table 6 below. We estimate that sport pilots will retire 1,400 aircraft per year and instructors will retire 130 aircraft per year, necessitating that the certificate of aircraft registration be returned to the registry. In calculating the accident investigation costs we also estimated in section A.4.4 that there might be an average of 33 accidents per year. We split the number of accidents

equally between pilots and instructors. The registration for these aircraft will also have to be returned to the registry.

Table 6. Cost of Returning Form 8050-3										
47.41, and 47.43										
Year	# of aircraft registered by pilots	Hours	Pilot wage	Cost for pilots	# of aircraft registered by instructors	Hours	Instructor wage	Cost for instructors	Undiscounted Cost	Discounted Cost
2004	1,417	1	\$31.50	\$44,636	146	1	\$34.65	\$5,059	\$49,694	\$46,443
2005	1,417	1	\$31.50	\$44,636	146	1	\$34.65	\$5,059	\$49,694	\$43,405
2006	1,417	1	\$31.50	\$44,636	146	1	\$34.65	\$5,059	\$49,694	\$40,565
2007	1,417	1	\$31.50	\$44,636	146	1	\$34.65	\$5,059	\$49,694	\$37,912
2008	1,417	1	\$31.50	\$44,636	146	1	\$34.65	\$5,059	\$49,694	\$35,431
2009	1,417	1	\$31.50	\$44,636	146	1	\$34.65	\$5,059	\$49,694	\$33,113
2010	1,417	1	\$31.50	\$44,636	146	1	\$34.65	\$5,059	\$49,694	\$30,947
2011	1,417	1	\$31.50	\$44,636	146	1	\$34.65	\$5,059	\$49,694	\$28,923
2012	1,417	1	\$31.50	\$44,636	146	1	\$34.65	\$5,059	\$49,694	\$27,030
2013	1,417	1	\$31.50	\$44,636	146	1	\$34.65	\$5,059	\$49,694	\$25,262
2004-2013				\$446,355				\$50,589	\$496,944	\$349,033

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Section 47.49 provides for issuance of a duplicate Certificate of Registration upon request and payment of fees, when the certificate has been lost or stolen. This requires no information other than that necessary to describe the requested service and identify the person or persons making the request as the registered owner(s) of the aircraft. The FAA estimated the cost of complying with these requirements will be approximately \$2,000 (\$1,000, discounted), as shown in Table 7. This cost was derived by multiplying the number of pilot aircraft by one hour, to account for the time it takes to comply with the paperwork requirements multiplied by their wage rate of \$31.50. The same calculation was used for the number of instructor aircraft, but with their wage rate of \$34.65.

Table 7. Cost of Obtaining a Duplicate Certificate of Registration when the Certificate has Been Lost										
47.49										
Year	# of new aircraft owned by pilots	Hours	Pilot wage	Cost for pilots	# of new aircraft owned by instructors	Hours	Instructor wage	Cost for instructors	Undiscounted Cost	Discounted Cost
2004	5	0.5	\$31.50	\$79	5	0.5	\$34.65	\$87	\$165	\$155
2005	5	0.5	\$31.50	\$79	5	0.5	\$34.65	\$87	\$165	\$144
2006	5	0.5	\$31.50	\$79	5	0.5	\$34.65	\$87	\$165	\$135
2007	5	0.5	\$31.50	\$79	5	0.5	\$34.65	\$87	\$165	\$126
2008	5	0.5	\$31.50	\$79	5	0.5	\$34.65	\$87	\$165	\$118
2009	5	0.5	\$31.50	\$79	5	0.5	\$34.65	\$87	\$165	\$110
2010	5	0.5	\$31.50	\$79	5	0.5	\$34.65	\$87	\$165	\$103
2011	5	0.5	\$31.50	\$79	5	0.5	\$34.65	\$87	\$165	\$96
2012	5	0.5	\$31.50	\$79	5	0.5	\$34.65	\$87	\$165	\$90
2013	5	0.5	\$31.50	\$79	5	0.5	\$34.65	\$87	\$165	\$84
2004-2013				\$788				\$866	\$1,654	\$1,162
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003										

Section 45.23 states when marks include only the Roman capital letter “N” and the registration number is displayed on limited, restricted or light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words “limited,” “restricted,” “light-sport,” “experimental,” or “provisional,” as applicable. The FAA estimated the cost of complying with this requirement will be approximately \$946,000 (\$813,000, discounted), as shown in Table 8. This cost was calculated by totaling the number of new and existing, pilot and instructor aircraft and multiplying their sum by fifty dollars, the cost to display an N-number.

Table 8. Cost to Display Aircraft Marks							
45.23							
Year	# of existing pilot owned aircraft that will display aircraft marks	# of existing instructor owned aircraft that will display aircraft marks	# of new pilot owned aircraft that will display aircraft marks	# of new instructor owned aircraft that will display aircraft marks	Cost per Aircraft	Undiscounted Cost	Discounted Cost
2004	7,000	700	400	70	\$50	\$402,625	\$376,285
2005	7,000	600	400	70	\$50	\$391,750	\$342,170
2006	0	0	800	90	\$50	\$11,125	\$9,081
2007	0	0	800	90	\$50	\$11,125	\$8,487
2008	0	0	1,200	110	\$50	\$16,375	\$11,675
2009	0	0	1,200	110	\$50	\$16,375	\$10,911
2010	0	0	1,600	130	\$50	\$21,625	\$13,467
2011	0	0	1,600	130	\$50	\$21,625	\$12,586
2012	0	0	2,000	150	\$50	\$26,875	\$14,618
2013	0	0	2,000	150	\$50	\$26,875	\$13,662
2004-2013						\$946,375	\$812,943
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003							

Over the next 10 years, the total cost of aircraft inspection, certification, and registration will be approximately \$65.2 million (\$46.6 million, discounted), of which, \$63.2 million (\$45.1 million, discounted) represent the out-of-pocket costs, as shown in Table S.1.

Table S.1. Cost of Aircraft Inspection, certification, and Registration (2004 -2013)	Total Cost Undiscounted	Total Cost Discounted	Out-of-pocket Cost Undiscounted	Out-of-pocket Cost Discounted
Table 1. Cost of Light-Sport Aircraft Airworthiness Certification Inspections	\$17,080,600	\$12,708,387	\$17,080,600	\$12,708,387
Table 2A. Costs of Purchasing Aircraft that Comply with the Consensus Standards	\$45,176,664	\$31,587,108	\$45,176,664	\$31,587,108
Table 3. Cost of Manufacturers Applying for a U.S. Identification Number	\$9,179	\$6,447	\$0	\$0
Table 4. Cost of Obtaining Identification number for: Existing and Kit-Built Light-Sport Aircraft	\$572,952	\$474,420	\$0	\$0
Table 5. Time Cost of Registering Aircraft New and Existing Light-Sport Aircraft	\$941,220	\$702,520	\$0	\$0
Table 6. Cost of Returning Form 8050-3	\$496,944	\$349,033	\$0	\$0
Table 7. Cost of Obtaining a Duplicate Certificate of Registration when the Certificate has Been Lost	\$1,654	\$1,162	\$0	\$0
Table 8. Cost to Display Aircraft Marks	\$946,375	\$812,943	\$946,375	\$812,943
Total	\$65,225,588	\$46,642,019	\$63,203,639	\$45,108,437
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				

B.2.2. Training, Testing, and Registration of Sport Pilots and Instructors of Sport Pilots

The light sport aircraft associations currently provide pilot and instructor training to their members. The FAA estimates that 75 percent of the existing pilots who will become sport pilots and future sport pilots belong to, or will belong to, these associations. These training requirements are summarized in appendix F for each of the trade associations

and presented with the training requirements that the FAA will require. These tables provide a useful comparison of the rule (FAA requirements) with current practice for those who are members of trade associations. The FAA estimates that 25% of the existing pilots who will become sport pilots are not registered with FAA-recognized ultralight organizations.⁸ Furthermore, the FAA assumes that these individuals are not certified pilots and that they are flying uncertified ultralight-like aircraft.

B.2.2.1. Rule for Training, Testing, and Registration of Sport Pilots and Instructors of Sport Pilots

The rule will create two new certificates; sport pilot and flight instructor with a sport pilot rating. Each certificate will include additional privileges for aircraft category, class, and make and model privileges that can be exercised with proper logbook endorsements after the pilot receives the appropriate additional training.

To earn a sport pilot certificate, an individual must have a minimum number of hours of flight experience in a light-sport aircraft⁹ and must pass a knowledge test and a practical test. Sport pilot candidates, who are registered ultralight pilots with an FAA recognized ultralight organization, do not have to take any additional FAA approved training; however, they do have to take a knowledge test and a practical test. A sport pilot must also comply with the airman certification requirements in part 61, the operating rules in part 91, the medical certification requirements in part 67, or hold a valid U.S. driver's license. Some of the privileges a sport pilot can exercise with proper logbook endorsements are the ability to operate in specific class B, C, or D airspace, to operate a different make and model light-sport aircraft in another set of aircraft, and to carry a passenger.

⁸ An FAA-Recognized Ultralight Organization is an organization comprised of individuals who are ultralight enthusiast and provide training under an exemption to Part 103, such as the EAA, ASC and the USUA.

⁹ The minimum number of hours will depend on the category and privilege that the pilot is seeking. This can be up to twenty hours for airplane category and single-engine class privileges, but are lower for other category and privileges.

In order for an individual to earn a flight instructor certificate with a sport pilot rating, that person must have a minimum of 150 hours flight experience as a pilot (for airplane privileges with lower hours for other categories and privileges), pass a knowledge test, a fundamentals of instruction test and a practical test. Sport pilot instructor candidates that are with a FAA recognized ultralight organization will not have to take additional instruction (but they must meet the minimum total flight time requirements).

Furthermore, instructors with these organizations do not have to meet the aeronautical knowledge requirement if they've passed the organization's fundamentals of instruction knowledge test. After earning the flight instructor certificate with a sport pilot rating, the individual will be allowed to provide instruction in a different set of aircraft, category of aircraft, or a class of aircraft given he/she logs and receives adequate endorsements indicating the additional training requirements are met.

B.2.2.2. Assumptions Covering Sport Pilots and Instructors of Sport Pilots

The following assumptions apply to the analysis on certification costs for sport pilots and flight instructors with sport pilot rating.

- 75% of the estimated existing 14,000 pilots, or 10,500, are pilots with FAA-recognized ultralight organizations and as such will not have to receive and log ground and/or flight training to meet the experience requirements of provisions §§ 61.309, 61.311, and 61.313 before taking the practical and knowledge tests.
- 25% of estimated existing pilots, or 3,500 are not members of an FAA recognized ultralight organization and will be required to take ground and flight training to meet the experience requirements of provisions §§ 61.309, 61.311, and 61.313.
- 100% of estimated existing (1,300) instructors are ultralight instructors with FAA-recognized ultralight organizations and as such will not have to receive and log ground and/or flight training to meet the experience requirements of provisions §§ 61.309, 61.311, and 61.313 before taking the practical and knowledge tests to receive sport pilot certification.

- 100% of estimated 12,000 new sport pilots will have to take ground and flight training to meet the requirements of provisions §§ 61.309, 61.311, and 61.313 before taking the practical and knowledge to become certified as sport pilots. The FAA is aware that some of the new pilots may choose to receive training from ultralight organizations and credit that experience¹⁰ towards a sport pilot certificate, but to be conservative, we assume that all new sports pilot will have to log the full amount of ground and/or flight training.
- All those who wish to become sport pilot flight instructors will need to first become certified as sport pilots.

B.2.2.3. Analysis of Costs for Training, Testing, and Registering Sport Pilots

The student sport pilot must receive and log ground training from an authorized instructor or complete an authorized home-study course on certain aeronautical knowledge areas. In addition, the candidate must receive and log ground and flight training from an authorized instructor on certain areas of operation, as appropriate, for airplane single-engine, glider, gyroplane, airship, balloon, powered parachute, and weight-shift-control aircraft privileges. The candidate must go through the process of applying for an airmen certificate and the candidate must take and pass a knowledge and practical test before receiving certification as a sport pilot. The cost of each of the required steps is estimated in the following paragraphs.

B.2.2.3.1. Ground Training

Provisions 61.319 and 61.311 require a candidate for sport pilot certification to receive and log ground training on specified knowledge and proficiency areas. The cost of ground training includes the cost of the ground training course, and cost of the time the pilot devotes to home studying, and the cost of the time the pilot spends in class. Furthermore, Table 9A and 9B assume that all sport pilot candidates will take an

¹⁰ Those who become registered ultralight pilots with FAA-recognized organizations after the publication date of the rule may credit experience towards the sport pilot flight time requirement under provision 61.393(b)(2).

authorized class and pay \$55 for class textbooks. Sport pilot candidates who do not train through associations will need an average of 10 hours each in study time plus 20 hours of home study. Members of FAA recognized ultralight organizations will need the same amount of time for ground training purposes. However, the FAA recognizes that ultralight associations currently provide ground training that is composed of 7 hours of class time and 14 hours of home study time. This rule will require the members of the FAA recognized ultralight organizations to take an additional 3 hours of class time and an additional 6 hours of home study. Tables 9A and 9B estimate the costs of each pilot paying for the course and the cost that the student's time studying the course material. Furthermore, pilots will spend time attending to a class on ground training with an authorized instructor. We estimate that each pilot who is not training through an association will spend 10 hours with an authorized instructor in a ground training class (composed of 20 students), whereas each pilot who is training with an association will spend an additional 3 hours with an authorized instructor in a ground training class (composed of 20 students). Existing instructors will not have to take this training since we assume that existing instructors have all been ultralight instructors from FAA-recognized ultralight organizations and therefore are not subject to this requirement. All new pilots will have to take ground training because we assume that all new pilots have no previous training.

Out-of-pocket costs with respect to ground training costs are the cost of the class and the cost of books and other materials for the class. The out-of-pocket costs for pilots who are not members of an FAA recognized ultralight organization are estimated to be \$72¹¹, and \$60¹² for pilots who are members of an FAA recognized ultralight organization. The value of time is considered to be a cost to the student pilots in this analysis. The FAA estimated an average additional time cost of \$945¹³ for student pilots who are not members of an FAA recognized ultralight organization and \$284¹⁴ for student pilots who are members of an FAA recognized ultralight organization. Therefore, the total

¹¹ $\$55 + [(10/20) \times \$34.65]$.

¹² $\$55 + [(3/20) \times \$34.65]$.

¹³ $(20 \times \$31.50) + (10 \times \$31.50)$.

¹⁴ $(6 \times \$31.50) + (3 \times \$31.50)$.

individual costs for pilots who are not members of an FAA recognized ultralight organization are estimated to be \$1,017¹⁵ and \$344¹⁶ for pilots who are members of an FAA recognized ultralight organization.

The total cost over a 10-year period of ground training for student pilots who are not members of an FAA recognized ultralight organization is \$6.6 million (\$5.2 million, discounted), and the out-of pocket costs are estimated to be \$470,000 over the next ten years as displayed in Table 9A. The total cost of ground training for student pilots who are members of an FAA recognized ultralight organization is \$3.1 million (\$2.0 million, discounted), and the out-of pocket costs are estimated to be \$542,000 over the next ten years as displayed in Table 9B.

¹⁵ \$945 + \$72.

¹⁶ \$60 + \$284.

Table 9A. Ground Training Costs for Pilots not with Associations												
Year	# of existing pilots not with associations	# of new pilots	Study hours	Pilot wage	Instructor wage	Average instruction hrs	Home cost of study time	Value of students' time in class	Cost of the Class	Cost of the Course	Undiscounted Cost	Discounted Cost
	a	b	c	d	e	f	(a + b) x c x d	(a + b) x f x d	[(a + b) x f] / 20 x e	(a + b) x \$55		
2004	1,750	100	20	\$31.50	\$34.65	10	\$1,165,500	\$582,750	\$32,051	\$101,750	\$1,882,051	\$1,758,926
2005	1,750	100	20	\$31.50	\$34.65	10	\$1,165,500	\$582,750	\$32,051	\$101,750	\$1,882,051	\$1,643,856
2006	0	200	20	\$31.50	\$34.65	10	\$126,000	\$63,000	\$3,465	\$11,000	\$203,465	\$166,088
2007	0	200	20	\$31.50	\$34.65	10	\$126,000	\$63,000	\$3,465	\$11,000	\$203,465	\$155,222
2008	0	300	20	\$31.50	\$34.65	10	\$189,000	\$94,500	\$5,198	\$16,500	\$305,198	\$217,602
2009	0	300	20	\$31.50	\$34.65	10	\$189,000	\$94,500	\$5,198	\$16,500	\$305,198	\$203,366
2010	0	400	20	\$31.50	\$34.65	10	\$252,000	\$126,000	\$6,930	\$22,000	\$406,930	\$253,416
2011	0	400	20	\$31.50	\$34.65	10	\$252,000	\$126,000	\$6,930	\$22,000	\$406,930	\$236,837
2012	0	500	20	\$31.50	\$34.65	10	\$315,000	\$157,500	\$8,663	\$27,500	\$508,663	\$276,679
2013	0	500	20	\$31.50	\$34.65	10	\$315,000	\$157,500	\$8,663	\$27,500	\$508,663	\$258,578
2004-2013							\$4,095,000	\$2,047,500	\$112,613	\$357,500	\$6,612,613	\$5,170,570

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Table 9B. Ground Training Costs for Pilots with Associations											
Year	# of new pilots	Study hours	Pilot wage	Instructor wage	Average instruction hrs	Home cost of study time	Value of students' time in class	Cost of the Class	Cost of the Course	Undiscounted Cost	Discounted Cost
	b	c	d	e	f	b x c x d	b x f x d	(b x f) / 20 x e	b x \$55		
2004	300	6	\$31.50	\$34.65	3	\$56,700	\$28,350	\$1,559	\$16,500	\$103,109	\$96,364
2005	300	6	\$31.50	\$34.65	3	\$56,700	\$28,350	\$1,559	\$16,500	\$103,109	\$90,060
2006	600	6	\$31.50	\$34.65	3	\$113,400	\$56,700	\$3,119	\$33,000	\$206,219	\$168,336
2007	600	6	\$31.50	\$34.65	3	\$113,400	\$56,700	\$3,119	\$33,000	\$206,219	\$157,323
2008	900	6	\$31.50	\$34.65	3	\$170,100	\$85,050	\$4,678	\$49,500	\$309,328	\$220,546
2009	900	6	\$31.50	\$34.65	3	\$170,100	\$85,050	\$4,678	\$49,500	\$309,328	\$206,118
2010	1,200	6	\$31.50	\$34.65	3	\$226,800	\$113,400	\$6,237	\$66,000	\$412,437	\$256,845
2011	1,200	6	\$31.50	\$34.65	3	\$226,800	\$113,400	\$6,237	\$66,000	\$412,437	\$240,042
2012	1,500	6	\$31.50	\$34.65	3	\$283,500	\$141,750	\$7,796	\$82,500	\$515,546	\$280,423
2013	1,500	6	\$31.50	\$34.65	3	\$283,500	\$141,750	\$7,796	\$82,500	\$515,546	\$262,078
2004-2013						\$1,701,000	\$850,500	\$46,778	\$495,000	\$3,093,278	\$1,978,134

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

B.2.2.3.2 Knowledge Test

Provision § 61.307 requires an applicant for sport pilot certification take and pass a knowledge test. Before taking the knowledge test, the applicant must receive a logbook endorsement from an authorized instructor. The costs of the knowledge test requirement are presented in Table 10 and include the cost of the actual test, the cost of the time to take the knowledge test, and the cost of the candidate's time and the instructor's time for entering the logbook endorsement required before taking the test. Except for 75 percent of new pilots that are assumed to have taken the knowledge tests through their associations, the remaining sport pilot candidates are required to take this test. Included with the remaining 25 percent of the population taking the knowledge test before receiving a sport pilot certificate are all existing ultralight pilots who want to become sport pilot and existing ultralight instructors (all existing instructors will have to receive a sport pilot certificate before becoming certified as an instructor with a sport pilot rating).

Out-of-pocket costs with respect to the knowledge test include the cost of the test, which is estimated to be \$90, and the additional instructor time needed for the logbook endorsement, which is estimated to be \$2.89¹⁷. Additionally, the FAA estimated time costs of \$66¹⁸ per sport pilot candidate and \$72¹⁹ per instructor candidate.

The total cost over a 10-year period of the knowledge test is \$2.9 million (\$2.5 million, discounted), and the out-of-pocket costs are estimated to be \$1.6 million over the next ten years as displayed in Table 10.

For purposes of this evaluation, we estimate that 10% of the pilots will fail the knowledge test and be required to retake the test. Under provision 61.49, an applicant who fails a knowledge or practical test may reapply for the test only after receiving additional training from an authorized instructor and a logbook endorsement from an authorized instructor. Table 11 displays the costs of retesting after failure. These costs include the

¹⁷ $((5/60) \times \$34.65)$.

¹⁸ $((5/60) \times \$31.50) + (2 \times \$31.50)$.

¹⁹ $((5/60) \times \$34.65) + (2 \times \$34.65)$.

cost of 10% of applicants receiving additional training from an authorized instructor and retaking the knowledge test.

Out-of-pocket costs with respect to pilots who fail the knowledge test include the cost of the test, which is estimated to be \$90, and the additional instructor time needed for the logbook endorsement, which is estimated to be \$2.89²⁰. Additionally, the FAA estimated time costs of \$105²¹ per pilot candidate and \$116²² per instructor candidate.

Total costs of the knowledge test for pilots and instructors who fail it are \$349,000 (\$300,000, discounted), and the out-of pocket costs are estimated to be \$165,000 over the next ten years as displayed in Table 11.

²⁰ $((5/60) \times \$34.65).$

²¹ $((5/60) \times \$31.50) + (2 \times \$31.50). + (\$31.50 \times 0.25) + (\$31.50 \times 1)$

²² $((5/60) \times \$34.65) + (2 \times \$34.65). + (\$34.65 \times 0.25) + (\$34.65 \times 1)$

Table 10. Knowledge Test Costs													
Year	# of existing pilots	# of new pilots (25%)	# of existing instructors	Pilot wage	Instructor Wage	Average hrs to take the knowledge test	Average cost of the knowledge test	Logbook Endorsees Time	Logbook Endorsers Time	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost
	a1	a2	b	c	d	e	f	$((a1+a2) \times 5/60 \text{ hours} \times c) + ((b) \times 5/60 \text{ hours} \times d)$	$((a1+a2+b) \times 5/60 \text{ hours} \times d)$	$((a1+a2) \times c \times e) + (b \times d \times e)$	$((a1+a2) \times f) + (b \times g)$		
2004	7,000	100	700	\$31.50	\$34.65	2	\$90.00	\$20,659	\$22,523	\$495,810	\$702,000	\$1,240,991	\$1,159,805
2005	7,000	100	600	\$31.50	\$34.65	2	\$90.00	\$20,370	\$22,234	\$488,880	\$693,000	\$1,224,484	\$1,069,512
2006	0	200		\$31.50	\$34.65	2	\$90.00	\$525	\$578	\$12,600	\$18,000	\$31,703	\$25,879
2007	0	200		\$31.50	\$34.65	2	\$90.00	\$525	\$578	\$12,600	\$18,000	\$31,703	\$24,186
2008	0	300		\$31.50	\$34.65	2	\$90.00	\$788	\$866	\$18,900	\$27,000	\$47,554	\$33,905
2009	0	300		\$31.50	\$34.65	2	\$90.00	\$788	\$866	\$18,900	\$27,000	\$47,554	\$31,687
2010	0	400		\$31.50	\$34.65	2	\$90.00	\$1,050	\$1,155	\$25,200	\$36,000	\$63,405	\$39,485
2011	0	400		\$31.50	\$34.65	2	\$90.00	\$1,050	\$1,155	\$25,200	\$36,000	\$63,405	\$36,902
2012	0	500		\$31.50	\$34.65	2	\$90.00	\$1,313	\$1,444	\$31,500	\$45,000	\$79,256	\$43,110
2013	0	500		\$31.50	\$34.65	2	\$90.00	\$1,313	\$1,444	\$31,500	\$45,000	\$79,256	\$40,290
2004-2013								\$48,379	\$52,841	\$1,161,090	\$1,647,000	\$2,909,310	\$2,504,761

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003
Source for the average cost to take the knowledge test: ASC
Notes:
1) According to ASC, the cost of the knowledge test is between \$65 and \$120 or \$92.50 $[(65+120)/2]$ on average. We rounded it down to \$90 to avoid spurious accuracy.

Table 11. Cost of Retesting Sport Pilot Candidates Who Fail the Knowledge Test															
Year	# of existing pilots	# of new pilots (25%)	# of existing and new instructors	Pilot wage	Instructor Wage	Average hrs to take the knowledge test	Average cost of the knowledge test	Average hrs needed to retrain	Logbook Endorsees Time	Logbook Endorsers Time	Cost of time to retrain	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost
	a ¹	a2	b ¹	c	d	e	f ²	g	((a1+a2) x 5/60 hours x c)+(b) x 5/60 hours x d)	((a1+a2+b) x 5/60 hours x d)	((a1+a2) x c x g) + (b x d x g)	((a1+a2) x c x e) + (b x d x e)	((a1+a2) x f) + (b x g)		
2004	700	10	70	\$31.50	\$34.65	2	\$90.00	1.00	\$2,066	\$2,252	\$24,791	\$49,581	\$70,200	\$148,890	\$139,149
2005	700	10	60	\$31.50	\$34.65	2	\$90.00	1.00	\$2,037	\$2,223	\$24,444	\$48,888	\$69,300	\$146,892	\$128,301
2006	0	20		\$31.50	\$34.65	2	\$90.00	1.00	\$53	\$58	\$630	\$1,260	\$1,800	\$3,800	\$3,102
2007	0	20		\$31.50	\$34.65	2	\$90.00	1.00	\$53	\$58	\$630	\$1,260	\$1,800	\$3,800	\$2,899
2008	0	30		\$31.50	\$34.65	2	\$90.00	1.00	\$79	\$87	\$945	\$1,890	\$2,700	\$5,700	\$4,064
2009	0	30		\$31.50	\$34.65	2	\$90.00	1.00	\$79	\$87	\$945	\$1,890	\$2,700	\$5,700	\$3,798
2010	0	40		\$31.50	\$34.65	2	\$90.00	1.00	\$105	\$116	\$1,260	\$2,520	\$3,600	\$7,601	\$4,733
2011	0	40		\$31.50	\$34.65	2	\$90.00	1.00	\$105	\$116	\$1,260	\$2,520	\$3,600	\$7,601	\$4,424
2012	0	50		\$31.50	\$34.65	2	\$90.00	1.00	\$131	\$144	\$1,575	\$3,150	\$4,500	\$9,501	\$5,168
2013	0	50		\$31.50	\$34.65	2	\$90.00	1.00	\$131	\$144	\$1,575	\$3,150	\$4,500	\$9,501	\$4,830
2004-2013									\$4,838	\$5,284	\$58,055	\$116,109	\$164,700	\$348,986	\$300,469
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003															
Source for the average cost to take the knowledge test:ASC															
Notes:															
1) The FAA assumes that approximately 10% of the pilots and instructors will fail the knowledge test..															
2) According to ASC, the cost of the knowledge test is between \$65 and \$120 or \$92.50 [(65+120)/2] on average. We rounded it down to \$90 to avoid spurious accuracy.															

B.2.2.3.3. Flight Training

Ultralight pilots with FAA-recognized ultralight organizations – provide FAA certified copy of ultralight pilot records

Section 61.329 (a)(3) will allow ultralight pilots who are members of FAA-recognized ultralight organizations to take the practical and knowledge tests without any additional flight training. They will have to provide the FAA with a certified copy of their ultralight pilot records from the organization. Estimates of the costs that these pilots will incur to provide the FAA with certified copies of their association records are in Table 12.

Table 12. Cost to Provide the FAA a Certified Copy of Ultralight Pilot Records														
Year	# of existing pilots	# of existing instructors	Average pilot/instructor hrs spent writing letter	Average clerical hrs needed to process letter	Average pilot/instructor hrs to send certified copy to the FAA	Pilot wage	Clerical Wage	Instructor Wage	Postage	Cost of pilot time	Cost of instructor and clerical time	Mailing Costs	Total Undiscounted Cost	Discounted Cost
	a ¹	b ²	c	d	e	f	g	h	i	(a x c x f) + (a x e x f)	(a x d x g) + (b x c x h) + (b + d + g) + (b x e x h)	(3 x a x i) + (3 x b x i)		
2004	5,250	700	0.08	0.17	0.08	\$31.50	\$17.93	\$34.65	\$0.37	\$27,563	\$21,823	\$6,605	\$55,990	\$52,327
2005	5,250	600	0.08	0.17	0.08	\$31.50	\$17.93	\$34.65	\$0.37	\$27,563	\$20,947	\$6,494	\$55,003	\$48,042
2006	0	0	0.08	0.17	0.08	\$31.50	\$17.93	\$34.65	\$0.37	\$0	\$0	\$0	\$0	\$0
2007	0	0	0.08	0.17	0.08	\$31.50	\$17.93	\$34.65	\$0.37	\$0	\$0	\$0	\$0	\$0
2008	0	0	0.08	0.17	0.08	\$31.50	\$17.93	\$34.65	\$0.37	\$0	\$0	\$0	\$0	\$0
2009	0	0	0.08	0.17	0.08	\$31.50	\$17.93	\$34.65	\$0.37	\$0	\$0	\$0	\$0	\$0
2010	0	0	0.08	0.17	0.08	\$31.50	\$17.93	\$34.65	\$0.37	\$0	\$0	\$0	\$0	\$0
2011	0	0	0.08	0.17	0.08	\$31.50	\$17.93	\$34.65	\$0.37	\$0	\$0	\$0	\$0	\$0
2012	0	0	0.08	0.17	0.08	\$31.50	\$17.93	\$34.65	\$0.37	\$0	\$0	\$0	\$0	\$0
2013	0	0	0.08	0.17	0.08	\$31.50	\$17.93	\$34.65	\$0.37	\$0	\$0	\$0	\$0	\$0
2004-2013										\$55,125	\$42,770	\$13,098	\$110,993	\$100,369
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003														
Notes:														
1) The FAA assumes that approximately 75% of existing pilots will provide the FAA a certified copy of ultralight pilot records.														
2) The FAA assumes that 100% of existing instructors will provide the FAA a certified copy of ultralight pilot records.														

Flight Training for Sport Pilot Candidates

Section 61.311 requires that an applicant for a sport pilot certificate receive and log flight training as well as ground training from an authorized instructor. Requirements for flight time training vary depending on the aircraft category, privileges the sport pilot applicant is seeking, and whether the sport pilot applicant is or is not a member of an FAA recognized ultralight association. For pilots not with associations, the following category privileges require a minimum of 20 hours training: airplane category and single-engine class privileges, rotorcraft category and gyroplane class privileges, lighter-than-air category and airship class privileges, and weight-shift-control aircraft. Other categories require fewer minimum number of flight hours. However, actual training might be more than the minimum required. For this analysis, the FAA will assume that each pilot who is not with associations requires 20 hours of flight training;²³ fifteen hours will be for required dual instruction and five hours will be for solo flights. Each hour of dual flight time will be accompanied with a pre-flight briefing between the instructor and the pilot and a post-flight briefing followed by the instructor making an entry into the sport pilots candidates logbook. These activities are estimated to total to one hours time for each hour of dual flight time. For sport pilot candidates who would train through an FAA recognized ultralight organization, the FAA estimates that this rule would add an additional 10 hours training (8 hours of dual flight training and 2 hours of solo flight training).

Table 13A estimates the cost of the flight training requirements for sport pilot applicants who are not with associations. This cost includes the cost of training, the cost of students' time needed for briefing or debriefing the students before and after the flight, the cost of 20 hours pilot time devoted to training, and the cost of logbook endorsements. The FAA estimated an average of \$2,190 for the cost of training pilots who are not members of an FAA recognized ultralight organization. This estimate may be broken down as such:

²³ According to EAA's sport pilot website, 20 hours of instruction is the expected average, <http://www.sportpilot.org/introduction.html>

- \$1270 (15 hours x (\$34.65/hour + \$50/hour of aircraft rental)) for dual flight training.
- \$250 (5 hours x \$50/hour) for renting an aircraft for solo training.
- \$520 (15 hours x \$34.65) for the instructors' time needed for briefing or debriefing the students before and after the flight.
- \$150 for training materials.

The out-of-pocket cost with respect to flight training costs for student sport pilots who are not members of an FAA recognized ultralight organization include the cost of the training, which is estimated to be \$2,245, including the additional instructor time needed for the logbook endorsement.²⁴ The FAA estimated an average additional time cost of \$1,260²⁵ for student pilots who are not members of an FAA recognized ultralight organization. Therefore, the total individual costs for pilots who are not members of and FAA recognized ultralight organization are estimated to be \$3,505²⁶.

The total cost of flight training for student pilots who are not members of an FAA recognized ultralight organization is \$22.4 million (\$17.5 million, discounted), and the out-of-pocket costs are estimated to be \$14.2 million over the next ten years as displayed in Table 13A. It is important to note that the logbook endorser's time is included in the average cost of training. Therefore, this column was displayed to the right of the discounted costs column to display the costs of the logbook endorsee's time, but not to double count this time. This step was repeated throughout the analysis with respect to flight training costs for either pilot candidates or instructor candidates.

Table 13B estimates the cost of the flight training requirement for sport pilot applicants who are with associations. This cost includes the cost of training, the cost of students' time needed for briefing or debriefing the students before and after the flight, the cost of 10 hours pilot time devoted to training, and the cost of logbook endorsements. The

²⁴ $20 \times 0.08 \times \$34.65$.

²⁵ $(20 \times \$31.50) + (20 \times 0.92 \times \$31.50) + (20 \times 0.08 \times \$31.50)$.

²⁶ $\$2,190 + \$55 + \$1,260$.

current cost of training pilots belonging to an association is \$1,130. The current cost of training pilots in an FAA recognized ultralight organization may be broken down as such:

- \$590 (7 hours x (\$34.65/hour + \$50/hour of aircraft rental)) for paying an instructor for 7 hours of dual flight training.
- \$150 (3 hours x \$50/hour) for renting an aircraft for solo training.
- \$240 (7 hours x \$34.65) for the instructors' time needed for briefing or debriefing the students before and after the flight.
- \$150 for training materials.

The out-of-pocket cost with respect to flight training costs for pilots who are members of an FAA recognized ultralight organization include the cost of the training, which is estimated to be \$1,088 including the additional instructor time needed for the logbook endorsement²⁷. The FAA estimated an average time cost of \$630²⁸ for student pilots who are members of an FAA recognized ultralight organization. The FAA estimates that the additional cost of flight training for pilots with associations is \$1,157 (\$2,245 minus \$1,088). The additional time cost is estimated to \$630. Therefore, the total individual costs for pilots who are members of an FAA recognized ultralight organization are estimated to be \$1,787 (\$1,157 + \$630).

The total cost of flight training for student pilots who are members of an FAA recognized ultralight organization is \$15.2 million (\$9.7 million, discounted), and the out-of-pocket costs are estimated to be \$9.5 million over the next ten years as displayed in Table 13B.

²⁷ $10 \times 0.08 \times \$34.65$.

²⁸ $(10 \times \$31.50) + (10 \times 0.92 \times \$31.50) + (10 \times 0.08 \times \$31.50)$.

Table 13A. Flight Training Costs of Pilots not with Associations														
Year	# of existing and new pilots	Average hrs spent in training	Average briefing/debriefing hrs	Average logbook hrs	Pilot wage	Average cost of training	Cost of student pilot time needed for training	Cost of students' time needed for briefing/debriefing	Cost of the training	Logbook Endorsees Time	Total Undiscounted Cost	Discount Factor	Discounted Cost	Logbook Endorsers Time
	a ¹	b	c	d	e	f	(a x b x e)	(a x b x c x e)	a x f	(a x b x d x e)				(a x b x d x \$34.65)
2004	1,850	20	0.92	0.08	\$31.50	\$2,190	\$1,165,500	\$1,068,375	\$4,051,500	\$97,125	\$6,382,500	0.93458	\$5,964,953	\$106,838
2005	1,850	20	0.92	0.08	\$31.50	\$2,190	\$1,165,500	\$1,068,375	\$4,051,500	\$97,125	\$6,382,500	0.87344	\$5,574,723	\$106,838
2006	200	20	0.92	0.08	\$31.50	\$2,190	\$126,000	\$115,500	\$438,000	\$10,500	\$690,000	0.81630	\$563,246	\$11,550
2007	200	20	0.92	0.08	\$31.50	\$2,190	\$126,000	\$115,500	\$438,000	\$10,500	\$690,000	0.76290	\$526,398	\$11,550
2008	300	20	0.92	0.08	\$31.50	\$2,190	\$189,000	\$173,250	\$657,000	\$15,750	\$1,035,000	0.71299	\$737,941	\$17,325
2009	300	20	0.92	0.08	\$31.50	\$2,190	\$189,000	\$173,250	\$657,000	\$15,750	\$1,035,000	0.66634	\$689,664	\$17,325
2010	400	20	0.92	0.08	\$31.50	\$2,190	\$252,000	\$231,000	\$876,000	\$21,000	\$1,380,000	0.62275	\$859,395	\$23,100
2011	400	20	0.92	0.08	\$31.50	\$2,190	\$252,000	\$231,000	\$876,000	\$21,000	\$1,380,000	0.58201	\$803,173	\$23,100
2012	500	20	0.92	0.08	\$31.50	\$2,190	\$315,000	\$288,750	\$1,095,000	\$26,250	\$1,725,000	0.54393	\$938,286	\$28,875
2013	500	20	0.92	0.08	\$31.50	\$2,190	\$315,000	\$288,750	\$1,095,000	\$26,250	\$1,725,000	0.50835	\$876,903	\$28,875
2004-2013							\$4,095,000	\$3,753,750	\$14,235,000	\$341,250	\$22,425,000		\$17,534,680	\$375,375

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Notes:

1) The FAA assumes that approximately 25% of existing pilots and new pilots will need flight training.

Table 13B. Flight Training Costs of Pilots with Associations													
Year	# of new pilots	Average hrs spent in training	Average briefing/debriefing hrs	Average logbook hrs	Pilot wage	Average cost of training	Cost of student pilot time needed for training	Cost of students' time needed for briefing/debriefing	Cost of the training	Logbook Endorsees Time	Total Undiscounted Cost	Discounted Cost	Logbook Endorsers Time
	a ¹	b	c	d	e	f	(a x b x e)	(a x b x c x e)	a x f	(a x b x d x e)			(a x b x d x \$34.65)
2004	300	10	0.92	0.08	\$31.50	\$1,060	\$94,500	\$86,625	\$318,000	\$7,875	\$507,000	\$473,832	\$8,663
2005	300	10	0.92	0.08	\$31.50	\$1,060	\$94,500	\$86,625	\$318,000	\$7,875	\$507,000	\$442,833	\$8,663
2006	600	10	0.92	0.08	\$31.50	\$1,060	\$189,000	\$173,250	\$636,000	\$15,750	\$1,014,000	\$827,726	\$17,325
2007	600	10	0.92	0.08	\$31.50	\$1,060	\$189,000	\$173,250	\$636,000	\$15,750	\$1,014,000	\$773,576	\$17,325
2008	900	10	0.92	0.08	\$31.50	\$1,060	\$283,500	\$259,875	\$954,000	\$23,625	\$1,521,000	\$1,084,452	\$25,988
2009	900	10	0.92	0.08	\$31.50	\$1,060	\$283,500	\$259,875	\$954,000	\$23,625	\$1,521,000	\$1,013,507	\$25,988
2010	1,200	10	0.92	0.08	\$31.50	\$1,060	\$378,000	\$346,500	\$1,272,000	\$31,500	\$2,028,000	\$1,262,936	\$34,650
2011	1,200	10	0.92	0.08	\$31.50	\$1,060	\$378,000	\$346,500	\$1,272,000	\$31,500	\$2,028,000	\$1,180,314	\$34,650
2012	1,500	10	0.92	0.08	\$31.50	\$1,060	\$472,500	\$433,125	\$1,590,000	\$39,375	\$2,535,000	\$1,378,872	\$43,313
2013	1,500	10	0.92	0.08	\$31.50	\$1,060	\$472,500	\$433,125	\$1,590,000	\$39,375	\$2,535,000	\$1,288,665	\$43,313
2004-2013							\$2,835,000	\$2,598,750	\$9,540,000	\$236,250	\$15,210,000	\$9,726,714	\$259,875
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003													
Notes:													
1) The FAA assumes that approximately 75% of new pilots will need flight training.													

B.2.2.3.4. Practical Tests

Making Application to Become a Sport Pilot

Section 61.13, requires an applicant for a sport pilot certificate and/or flight instructor certificate to submit FAA Form 8710-1 to the FAA district office or its representatives to determine qualifications of the applicant for issuance of a pilot or flight instructor certificate, rating, or authorization. The FAA plans to have this done through ACRA (airmen certification and rating application), which will be an electronic way to enter information required on form 8710-1. A modified version of form 8710-1 tailored to sport pilot certificates is being developed. The FAA estimates that it will require 15 minutes for the applicant²⁹ to work with his or her recommending instructor to complete the form. The instructor will then electronically sign it. The applicant will take the hard copy of the form to a DPE before taking the practical exam. The DPE will verify information on the form, such as the applicant's identification number; this will take about ten minutes.

The FAA estimated that the cost of complying with these requirements will be approximately \$1.05 million (\$0.82 million, discounted), as shown in Table 14.

²⁹ Who can be either an existing or new pilot or an existing ultralight instructor who is applying for sport pilot certification

Table 14. Cost of Applying to become a Sport Pilot (Form 8710-1)													
61.13													
Year	# of existing and new pilots	# of existing instructors	Pilot hours	Instructor hours	DPE hours	Pilot wage	Instructor Wage	DPE wage	Cost to fill out application for pilots	Cost to fill out applications for instructors	Cost of DPE verifying information	Undiscounted Cost	Discounted Cost
	a	b	c	d	e	f	g	h	$(a \times c \times f) + (a \times d \times g)$	$(b \times d \times g) + (b \times d \times g)$	$((a + b) \times e \times h) + (a \times e \times f) + (b \times e \times g)$		
2004	7,400	700	0.25	0.25	0.17	\$31.50	\$34.65	\$100.00	\$122,378	\$12,128	\$177,893	\$312,398	\$291,960
2005	7,400	600	0.25	0.25	0.17	\$31.50	\$34.65	\$100.00	\$122,378	\$10,395	\$175,648	\$308,421	\$269,387
2006	800	0	0.25	0.25	0.17	\$31.50	\$34.65	\$100.00	\$13,230	\$0	\$17,533	\$30,763	\$25,112
2007	800	0	0.25	0.25	0.17	\$31.50	\$34.65	\$100.00	\$13,230	\$0	\$17,533	\$30,763	\$23,469
2008	1,200	0	0.25	0.25	0.17	\$31.50	\$34.65	\$100.00	\$19,845	\$0	\$26,300	\$46,145	\$32,901
2009	1,200	0	0.25	0.25	0.17	\$31.50	\$34.65	\$100.00	\$19,845	\$0	\$26,300	\$46,145	\$30,748
2010	1,600	0	0.25	0.25	0.17	\$31.50	\$34.65	\$100.00	\$26,460	\$0	\$35,067	\$61,527	\$38,316
2011	1,600	0	0.25	0.25	0.17	\$31.50	\$34.65	\$100.00	\$26,460	\$0	\$35,067	\$61,527	\$35,809
2012	2,000	0	0.25	0.25	0.17	\$31.50	\$34.65	\$100.00	\$33,075	\$0	\$43,833	\$76,908	\$41,833
2013	2,000	0	0.25	0.25	0.17	\$31.50	\$34.65	\$100.00	\$33,075	\$0	\$43,833	\$76,908	\$39,096
2004-2013									\$429,975	\$22,523	\$599,008	\$1,051,505	\$828,631

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Practical Test for Sport Pilot Candidates

The FAA assumed that 75 percent of new pilots will take the practical test through their respective FAA recognized ultralight organizations. For these pilots this rule will not impose any cost, since requiring a practical test is current practice with these organizations. The remaining 25 percent of the sport pilot candidates are required to take this test and will incur some costs. Out-of-pocket costs with respect to the practical test include the costs of the test, which is estimated to be \$200, plus the additional cost for the instructor's time (\$2.89) needed for the logbook endorsement³⁰. Additionally, the FAA estimated time costs of \$66³¹ per pilot candidate and \$72³² per instructor candidate.

The total cost of the practical test is \$4.9 million (\$4.2 million, discounted), and the out-of-pocket costs are estimated to be \$3.7 million over the next ten years as displayed in Table 15.

An estimated 10% who take the practical test will fail it. If a candidate fails the practical test, he or she is required to retake only the portion of the test that he or she failed. Table 16 estimates the cost of an additional hour of training for the retest, the cost of reapplying to take the test (completing another FAA form 8710-1) after failure, and the cost of taking the test again. Out-of-pocket costs with respect to the practical test include the cost of the test, which is estimated to be \$200, plus the additional cost for the instructor's time (\$2.89) needed for the logbook endorsement³³. Additionally, the FAA estimated time costs of \$34³⁴ per pilot candidate and \$38³⁵ per instructor candidate.

The additional cost of the practical test for pilots and instructors who fail it is \$570,000 (\$491,000, discounted), and the out-of-pocket costs are estimated to be \$366,000 over the next ten years as displayed in Table 16.

³⁰ $((5/60) \times \$34.65).$

³¹ $((5/60) \times \$31.50) + (2 \times \$31.50).$

³² $((5/60) \times \$34.65) + (2 \times \$34.65).$

³³ $((5/60) \times \$34.65).$

³⁴ $((5/60) \times \$31.50) + (1 \times \$31.50).$

³⁵ $((5/60) \times \$34.65) + (1 \times \$34.65).$

Table 15. Practical Test Costs														
Year	# of existing pilots	# of new pilots	# of existing instructors	Pilot wage	Instructor Wage	Average hrs to take the practical test	Average cost of the practical test	Logbook Endorsees Time	Logbook Endorsers Time	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost	
	a1	a2	b	c	d	e	f	$((a1+a2) \times 5/60 \text{ hours} \times c) + ((b) \times 5/60 \text{ hours} \times d)$	$((a1+a2+b) \times 5/60 \text{ hours} \times d)$	$((a1+a2) \times c \times e) + (b \times c \times e)$	$((a1+a2) \times f) + (b \times f)$			
2004	7,000	100	700	\$31.50	\$34.65	2	\$200	\$20,659	\$22,523	\$491,400	\$1,560,000	\$2,094,581	\$1,957,553	
2005	7,000	100	600	\$31.50	\$34.65	2	\$200	\$20,370	\$22,234	\$485,100	\$1,540,000	\$2,067,704	\$1,806,013	
2006	0	200	0	\$31.50	\$34.65	2	\$200	\$525	\$578	\$12,600	\$40,000	\$53,703	\$43,837	
2007	0	200	0	\$31.50	\$34.65	2	\$200	\$525	\$578	\$12,600	\$40,000	\$53,703	\$40,969	
2008	0	300	0	\$31.50	\$34.65	2	\$200	\$788	\$866	\$18,900	\$60,000	\$80,554	\$57,434	
2009	0	300	0	\$31.50	\$34.65	2	\$200	\$788	\$866	\$18,900	\$60,000	\$80,554	\$53,676	
2010	0	400	0	\$31.50	\$34.65	2	\$200	\$1,050	\$1,155	\$25,200	\$80,000	\$107,405	\$66,886	
2011	0	400	0	\$31.50	\$34.65	2	\$200	\$1,050	\$1,155	\$25,200	\$80,000	\$107,405	\$62,511	
2012	0	500	0	\$31.50	\$34.65	2	\$200	\$1,313	\$1,444	\$31,500	\$100,000	\$134,256	\$73,027	
2013	0	500	0	\$31.50	\$34.65	2	\$200	\$1,313	\$1,444	\$31,500	\$100,000	\$134,256	\$68,249	
2004-2013								\$48,379	\$52,841	\$1,152,900	\$3,660,000	\$4,914,120	\$4,230,154	

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Table 16. Cost of Retesting after Pilots or Instructors Fail the Practical Test																			
Year	# of existing pilots	# of new pilots	# of existing instructors	Pilot wage	Instructor Wage	Average hrs to take the practical test	Average cost of the practical test	Average hrs needed to reapply (form 8710-1)	Average hrs needed to retrain	Logbook Endorsees Time	Logbook Endorsers Time	Cost of Reapplication (form 8710-1)	Cost of time to retrain	Cost of hiring instructors to retrain pilots	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost	
	a1 ¹	a2	b	c	d	e	f ²	g	h	$((a1+a2) \times 5/60 \text{ hours} \times c) + ((b) \times 5/60 \text{ hours} \times d)$	$((a1+a2+b) \times 5/60 \text{ hours} \times d)$	$((a1+a2) \times c \times g) + (b \times d \times g)$	$((a1+a2) \times c \times h) + (b \times d \times h)$	$((a1+a2) \times d \times h) + (b \times d \times h)$	$((a1+a2) \times d \times h) + (b \times d \times h)$	$((a1+a2) \times c \times e) + (b \times d \times e)$	$((a1+a2) \times f) + (b \times f)$		
2004	700	10	70	\$31.50	\$34.65	1	\$200	0.25	1.00	\$2,066	\$2,252	\$6,198	\$24,791	\$27,027	\$24,791	\$156,000	\$243,124	\$227,218	
2005	700	10	60	\$31.50	\$34.65	1	\$200	0.25	1.00	\$2,037	\$2,223	\$6,111	\$24,444	\$26,681	\$24,444	\$154,000	\$239,940	\$209,573	
2006	0	20	0	\$31.50	\$34.65	1	\$200	0.25	1.00	\$53	\$58	\$158	\$630	\$693	\$630	\$4,000	\$6,221	\$5,078	
2007	0	20	0	\$31.50	\$34.65	1	\$200	0.25	1.00	\$53	\$58	\$158	\$630	\$693	\$630	\$4,000	\$6,221	\$4,746	
2008	0	30	0	\$31.50	\$34.65	1	\$200	0.25	1.00	\$79	\$87	\$236	\$945	\$1,040	\$945	\$6,000	\$9,331	\$6,653	
2009	0	30	0	\$31.50	\$34.65	1	\$200	0.25	1.00	\$79	\$87	\$236	\$945	\$1,040	\$945	\$6,000	\$9,331	\$6,210	
2010	0	40	0	\$31.50	\$34.65	1	\$200	0.25	1.00	\$105	\$116	\$315	\$1,260	\$1,386	\$1,260	\$8,000	\$12,442	\$7,748	
2011	0	40	0	\$31.50	\$34.65	1	\$200	0.25	1.00	\$105	\$116	\$315	\$1,260	\$1,386	\$1,260	\$8,000	\$12,442	\$7,241	
2012	0	50	0	\$31.50	\$34.65	1	\$200	0.25	1.00	\$131	\$144	\$394	\$1,575	\$1,733	\$1,575	\$10,000	\$15,552	\$8,459	
2013	0	50	0	\$31.50	\$34.65	1	\$200	0.25	1.00	\$131	\$144	\$394	\$1,575	\$1,733	\$1,575	\$10,000	\$15,552	\$7,906	
2004-2013										\$4,838	\$5,284	\$14,514	\$58,055	\$63,410	\$58,055	\$366,000	\$570,154	\$490,840	

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Notes:

1) The FAA assumes that approximately 10% of the pilots and instructors will fail the practical test.

B.2.2.3.5. Flight Review (BFR)

Existing section 61.56 requires pilots to take a flight review every two years. Instructors must maintain their sport pilot certificates in order to remain instructors so they must take a flight review as well. The BFR will consist of one hour of ground review and one hour of flight review. New instructors and existing instructors only need to take the one hour flight review portion of the BFR. The out-of-pocket cost with respect to BFR costs is the cost of the BFR and it is estimated to be \$100 for new pilots and existing pilots and will cost approximately \$50 for new instructors and existing instructors. Additionally, the FAA estimated time costs of \$63³⁶ per pilot or instructor. The FAA made the implicit assumption that new instructors will come from the existing pilots and have been subtracted out of the costs to pilots sections of Tables 17 and 18. Total BFR costs³⁷ are estimated to be \$12.2 million (\$7.8 million, discounted), and the out-of-pocket costs are estimated to be \$7.5 million over the next ten years as displayed in Table 17. Table 18 displays the estimated total cost to society of BFR logbook endorsements. There are no out-of-pocket costs with respect to BFR logbook endorsements. The FAA estimated time costs of \$2.63³⁸ per pilot and \$2.89³⁹ per instructor. The estimated total cost to society is \$204,000 (\$130,000, discounted) over the next ten years, as displayed in Table 18.

³⁶ 2 x \$31.50.

³⁷ Some pilots will take to take the flight portion of the BFR in an instructors light-sport aircraft, which they would rent from the instructor, because they do not own a two-place light-sport aircraft and will pay a slightly higher cost for their BFR.

³⁸ (5/60) x \$31.50.

³⁹ (5/60) x \$34.65

Table 17. Flight Review Costs												
Year	BFR for Existing pilots	BFR for Existing Instructors	BFR for New Pilots	Average pilot hrs needed	Average BFR cost ¹	Pilot Wage	Instructor Wage	Cost of pilot time	Cost of instructor time	Cost of BFRs	Undiscounted Cost	Discounted Cost
	a	b ²	c	d	e	f	g	(a + c) x d x f	b x (d/2) x g	((a + c) x e) + (b x e/2)		
2004								\$0	\$0	\$0	\$0	\$0
2005								\$0	\$0	\$0	\$0	\$0
2006	7,000	700	400	2	\$100	\$31.50	\$34.65	\$466,200	\$24,255	\$775,000	\$1,265,455	\$1,032,988
2007	7,000	600	400	2	\$100	\$31.50	\$34.65	\$466,200	\$20,790	\$770,000	\$1,256,990	\$958,952
2008	7,000	700	1,200	2	\$100	\$31.50	\$34.65	\$516,600	\$24,255	\$855,000	\$1,395,855	\$995,225
2009	7,000	600	1,200	2	\$100	\$31.50	\$34.65	\$516,600	\$20,790	\$850,000	\$1,387,390	\$924,477
2010	7,000	700	2,400	2	\$100	\$31.50	\$34.65	\$592,200	\$24,255	\$975,000	\$1,591,455	\$991,078
2011	7,000	600	2,400	2	\$100	\$31.50	\$34.65	\$592,200	\$20,790	\$970,000	\$1,582,990	\$921,315
2012	7,000	700	4,000	2	\$100	\$31.50	\$34.65	\$693,000	\$24,255	\$1,135,000	\$1,852,255	\$1,007,504
2013	7,000	600	4,000	2	\$100	\$31.50	\$34.65	\$693,000	\$20,790	\$1,130,000	\$1,843,790	\$937,289
2004-2013								\$4,536,000	\$180,180	\$7,460,000	\$12,176,180	\$7,768,828

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003
Source for BFR:ASC
Notes:
1) According to ASC, the cost of the BFR is between \$80 and \$120 or \$100 [(80+120)/2] on average.
2) Flight instructors will need flight reviews to keep their sport pilot certificate current.

Table 18. Cost of BFR Logbook Endorsements									
Year	BFR for Existing pilots	BFR for Existing Instructors	BFR for New Pilots	Pilot Wage	Instructor Wage	Cost for Pilots	Cost for Instructors	Undiscounted Cost	Discounted Cost
	a	b	c	d	e	(a + c) x (5/60) x d	b x (5/60) x e		
2004						\$0	\$0	\$0	\$0
2005						\$0	\$0	\$0	\$0
2006	7,000	700	400	\$31.50	\$34.65	\$19,425	\$2,021	\$21,446	\$17,507
2007	7,000	600	400	\$31.50	\$34.65	\$19,425	\$1,733	\$21,158	\$16,141
2008	7,000	700	1,200	\$31.50	\$34.65	\$21,525	\$2,021	\$23,546	\$16,788
2009	7,000	600	1,200	\$31.50	\$34.65	\$21,525	\$1,733	\$23,258	\$15,497
2010	7,000	700	2,400	\$31.50	\$34.65	\$24,675	\$2,021	\$26,696	\$16,625
2011	7,000	600	2,400	\$31.50	\$34.65	\$24,675	\$1,733	\$26,408	\$15,369
2012	7,000	700	4,000	\$31.50	\$34.65	\$28,875	\$2,021	\$30,896	\$16,806
2013	7,000	600	4,000	\$31.50	\$34.65	\$28,875	\$1,733	\$30,608	\$15,559
2004-2013						\$189,000	\$15,015	\$204,015	\$130,292

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

B.2.2.3.6. Other Requirements for Sport Pilots

Requirement for recent flight experience

Section 61.57 states that no person may act as a pilot in command of an aircraft carrying passengers or of an aircraft certificated for more than one pilot flight crewmember unless that person has made at least three takeoffs and three landings within the preceding 90 days. For this rule the FAA assumes that all sport pilots will adhere to this requirement so that they can have the option of carrying passengers (new instructors were not included in this cost calculation because the FAA assumes that they come out of the existing pilots, and the new pilots from prior years). Affected pilots will spend 5 minutes to record a takeoff or a landing in their logbook. These recordings will be done 12 times

a year to comply with this requirement. Total costs, as shown in Table 19, sum to \$864,000 (\$681,000 discounted).

Year	# of existing pilots a	# of existing instructors b	# of new pilots c	Pilots Impacted d = a + c	Instructors impacted e = b	Value of time for pilots d x (5/60) x \$31.50 x 12	Value of time for instructors e x (5/60) x \$34.65 x 12	Undiscounted Cost	Discounted Cost
2004	7,000	700	400	7,400	700	\$233,100	\$24,255	\$257,355	\$240,519
2005	7,000	600	400	7,400	600	\$233,100	\$20,790	\$253,890	\$221,757
2006	0	0	800	800	0	\$25,200	\$0	\$25,200	\$20,571
2007	0	0	800	800	0	\$25,200	\$0	\$25,200	\$19,225
2008	0	0	1,200	1,200	0	\$37,800	\$0	\$37,800	\$26,951
2009	0	0	1,200	1,200	0	\$37,800	\$0	\$37,800	\$25,188
2010	0	0	1,600	1,600	0	\$50,400	\$0	\$50,400	\$31,387
2011	0	0	1,600	1,600	0	\$50,400	\$0	\$50,400	\$29,333
2012	0	0	2,000	2,000	0	\$63,000	\$0	\$63,000	\$34,268
2013	0	0	2,000	2,000	0	\$63,000	\$0	\$63,000	\$32,026
2004-2013						\$819,000	\$45,045	\$864,045	\$681,224

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Additional categories and classes

A sport pilot certificate will not list aircraft category and class ratings. Once a pilot has a sport pilot certificate the FAA will provide the pilot with an endorsement for the category, class, and make and model aircraft in which the pilot is authorized to act as pilot in command. In order to operate an additional category or class of light-sport aircraft (outside the set that includes the authorized make and model), the pilot must receive a logbook endorsement certifying attainment of specific proficiency requirements. The pilot must also successfully complete an application and pass a proficiency check for the privileges. We have no historical data on how many sport pilots will choose to operate additional and class aircraft. Therefore, we are unable quantify the costs of obtaining additional category and class privileges.

Additional make and models

Section 61.323 sport pilots who hold certificates to operate an aircraft in a given set of make and model of light-sport aircraft but, who want to operate aircraft within a different set the make and model of light-sport aircraft for which the pilots do not hold an endorsement will have to receive flight training in a make and model of light sport aircraft that is within the second set of light-sport aircraft. The pilots will also have to receive logbook endorsements certifying proficiency to operate those make and model. We have no historical data on how many sport pilots will choose to operate additional

make and model aircraft. Therefore, we are unable quantify the costs of obtaining additional make and model privileges. There is an unquantified cost to this provision.

Additional privileges

Sections 61.325 and 61.327 sport pilots may obtain additional privileges which allow operation of light-sport aircraft in Class B, C, or D airspace, or to, from, through or on an airport having an operational control tower. They may also obtain additional privileges, which allow operation of light-sport aircraft that have V_h greater than 87 knots CAS.

To obtain these extra privileges a sport pilot must receive additional ground and flight training and obtain a logbook endorsement from their instructor. The FAA has no historical data on how many sport pilots will choose to operate additional make and model aircraft. Therefore, we are unable quantify the costs of obtaining additional make and model privileges. There is an unquantified cost to this provision.

Summary of Cost to Become a Sport Pilot

Over 10 years, the total cost for training, testing, and registering sport pilots will be approximately \$70.5 million (\$51.4 million, discounted), of which \$37.9 million (\$27.6 million, discounted) represent the out-of-pocket costs, as shown in Table S.2.

Table S.2. Costs for Training, Testing, and Registering Sport Pilots (2004 -2013)	Total Cost Undiscounted	Total Cost Discounted	Out-of-pocket Cost Undiscounted	Out-of-pocket Cost Discounted
Table 9A. Ground Training Costs for Pilots not with Associations	\$6,612,613	\$5,170,570	\$357,500	\$279,538
Table 9B. Ground Training Costs for Pilots with Associations	\$3,093,278	\$1,978,134	\$495,000	\$316,550
Table 10. Knowledge Test Costs	\$2,909,310	\$2,504,761	\$1,647,000	\$1,417,759
Table 11. Cost of Retesting Sport Pilot Candidates Who Fail the Knowledge Test	\$348,986	\$300,469	\$164,700	\$141,776
Table 12. Cost to Provide the FAA a Certified Copy of Ultralight Pilot Records	\$110,993	\$100,369	\$13,098	\$11,844
Table 13A. Flight Training Costs of Pilots not with Associations	\$22,425,000	\$17,534,680	\$14,235,000	\$11,130,710
Table 13B. Flight Training Costs of Pilots with Associations	\$15,210,000	\$9,726,714	\$9,540,000	\$6,100,779
Table 14. Cost of Applying to become a Sport Pilot (Form 8710-1)	\$1,051,505	\$828,631	\$0	\$0
Table 15. Practical Test Costs	\$4,914,120	\$4,230,154	\$3,660,000	\$3,150,576
Table 16. Cost of Retesting after Pilots or Instructors Fail the Practical Test	\$570,154	\$490,840	\$366,000	\$315,058
Table 17. Flight Review Costs	\$12,176,180	\$7,768,828	\$7,460,000	\$4,759,584
Table 18. Cost of BFR Logbook Endorsements	\$204,015	\$130,292	\$0	\$0
Table 19. Recent Flight Experience	\$864,045	\$681,224	\$0	\$0
Total	\$70,490,197	\$51,445,667	\$37,938,298	\$27,624,173
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				

B.2.2.4. Analysis of Costs for Training, Testing, and Registering Instructors with a Sport pilot Rating

The instructor candidate who is not a registered ultralight instructor with an FAA recognized ultralight organization or an FAA certified instructor must receive and log ground training on the fundamentals of instruction and certain aeronautical knowledge areas. In addition, that candidate must receive and log ground and flight training on certain areas of operation, as appropriate, for type of light-sport aircraft for which he or she intends to provide instruction. The candidate must log a specified number of hours of flight time depending on the category and privileges for which the candidate is applying.

The candidate must complete FAA form 8710-1 to apply for a flight instructor certificate and the candidate must take and pass a knowledge and practical test before receiving certification. The flight instructor certificate must be renewed every 24 months in accordance with the provisions of § 61.197. If the certificate expires, the instructor must pass a practical test in order for the FAA to reinstate the privileges of the certificate. The cost of each of the required steps is estimated in the following paragraphs.

B.2.2.4.1. Ground Training

Provision 61.407 requires a candidate for a flight instructor certificate with a sport pilot rating to receive and log ground training on fundamentals of instruction, and on aeronautical knowledge areas applicable to a sport pilot certificate. Provision 61.409 requires a flight instructor candidate to receive and log ground training on certain areas of operation. These new requirements are no different from current practice at FAA recognized ultralight organizations. According to provision 61.433, instructors with FAA recognized ultralight organizations will not have to meet any additional experience requirements of §§ 61.407 and 61.409 and will not be required to take any additional ground training.

B.2.2.4.2. Knowledge Test

A person applying for a flight instructor certificate with a sport pilot rating must pass knowledge tests on the fundamentals of instructing, as listed in provision 61.407(a) and the aeronautical knowledge areas listed in 61.407(c). This is already current practice at FAA recognized organization, so this provision will not impose any additional requirements on new instructor candidates. However, existing instructors will have to take an aeronautical knowledge test. This test costs \$90 and the test will last two hours. This is the only out-of-pocket cost with respect to the knowledge test. Additionally, the FAA estimated time costs of \$69⁴⁰ per existing instructor. The total estimated 10-year cost is \$207,000 (\$188,000, discounted) of which \$117,000 is the out-of-pocket cost, as displayed in Table 20.

Table 20. Knowledge Test Costs								
Year	# of existing instructors	Student Instructor Wage	Average hrs to take the knowledge test	Average cost of the knowledge test	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost
	a	b	c	d ¹	(a x b x c)	(a x d)		
2004	700	\$34.65	2	\$90.00	\$48,510	\$63,000	\$111,510	\$104,215
2005	600	\$34.65	2	\$90.00	\$41,580	\$54,000	\$95,580	\$83,483
2006	0	\$34.65	2	\$90.00	\$0	\$0	\$0	\$0
2007	0	\$34.65	2	\$90.00	\$0	\$0	\$0	\$0
2008	0	\$34.65	2	\$90.00	\$0	\$0	\$0	\$0
2009	0	\$34.65	2	\$90.00	\$0	\$0	\$0	\$0
2010	0	\$34.65	2	\$90.00	\$0	\$0	\$0	\$0
2011	0	\$34.65	2	\$90.00	\$0	\$0	\$0	\$0
2012	0	\$34.65	2	\$90.00	\$0	\$0	\$0	\$0
2013	0	\$34.65	2	\$90.00	\$0	\$0	\$0	\$0
2004-2013					\$90,090	\$117,000	\$207,090	\$187,698
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003								
Source for the average cost to take the knowledge test:ASC								
Notes:								
1) According to ASC, the cost of the knowledge test is between \$65 and \$120 or \$92.50 [(65+120)/2] on average.								
We rounded it down to \$90.								

Table 21 displays the costs of retaking the test imposed on those who fail the knowledge test. It is assumed that approximately 10% of the instructor applicants will fail the

⁴⁰ ((5/60) x \$31.50) + (2 x \$31.50).

knowledge test and be required to retake the test. The out-of-pocket cost with respect to instructors who fail the knowledge test is the cost of the test, which is estimated to be \$90. Additionally, the FAA estimated time costs of \$116⁴¹ per instructor candidate.

The total cost of the knowledge test for instructors who fail it is \$25,000 (\$23,000, discounted), and the out-of-pocket costs are estimated to be \$12,000 over the next ten years.

Table 21. Cost of Retesting after Instructors Fail the Knowledge Test											
Year	# of existing instructors	Student instructor Wage	Average hrs to take the knowledge test	Average cost of the knowledge test	Average hrs needed to retrain	Cost of time to retrain	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost		Discounted Cost
	a ¹	b	c	d ²	e	(a x b x c)	(a x b x c)	(a x d)			
2004	70	\$34.65	2	\$90.00	1.00	\$2,426	\$4,851	\$6,300	\$13,577	0.93458	\$12,688
2005	60	\$34.65	2	\$90.00	1.00	\$2,079	\$4,158	\$5,400	\$11,637	0.87344	\$10,164
2006	0	\$34.65	2	\$90.00	1.00	\$0	\$0	\$0	\$0	0.81630	\$0
2007	0	\$34.65	2	\$90.00	1.00	\$0	\$0	\$0	\$0	0.76290	\$0
2008	0	\$34.65	2	\$90.00	1.00	\$0	\$0	\$0	\$0	0.71299	\$0
2009	0	\$34.65	2	\$90.00	1.00	\$0	\$0	\$0	\$0	0.66634	\$0
2010	0	\$34.65	2	\$90.00	1.00	\$0	\$0	\$0	\$0	0.62275	\$0
2011	0	\$34.65	2	\$90.00	1.00	\$0	\$0	\$0	\$0	0.58201	\$0
2012	0	\$34.65	2	\$90.00	1.00	\$0	\$0	\$0	\$0	0.54393	\$0
2013	0	\$34.65	2	\$90.00	1.00	\$0	\$0	\$0	\$0	0.50835	\$0
2004-2013						\$4,505	\$9,009	\$11,700	\$25,214		\$22,853
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003											
Source for the average cost to take the knowledge test: ASC											
Notes:											
1) The FAA assumes that approximately 10% of the pilots and instructors will fail the knowledge test..											
2) According to ASC, the cost of the knowledge test is between \$65 and \$120 or \$92.50 [(65+120)/2] on average. We rounded it down to \$90.											

B.2.2.4.3. Flight Training

Registered ultralight instructors with FAA-recognized ultralight organizations – provide FAA certified copy of ultralight pilot records

The rule via provision § 61.433 will allow individuals who are flight instructors with FAA recognized ultralight organizations to credit their experience to meet the aeronautical knowledge requirements specified in § 61.407, the flight proficiency requirements specified in § 61.409, and the aeronautical experience requirements of § 61.411. They will have to submit a copy of their ultralight pilot records from the organization. We assume that 100% of existing instructors will be with an FAA

⁴¹ (2 x \$34.65). + (\$34.65 x 0.25) + (\$34.65 x 1)

recognized ultralight organization. The out-of-pocket cost with respect to instructors who provide the FAA a certified copy of ultralight pilot records is the mailing cost, which is estimated to be \$1⁴². Additionally, the FAA estimated time costs of \$3⁴³ per instructor and \$3⁴⁴ of clerical time.

The total cost is approximately \$13,000 (\$12,000, discounted), and the out-of-pocket cost is estimated to be \$1,000 over the next ten years, as shown in Table 22.

⁴² 3×0.37

⁴³ $(0.08 \times \$34.65) + (0.08 \times \$34.65)$

⁴⁴ $0.17 \times \$34.65$

Table 22. Cost of Instructor and Clerical Time to Submit Records from an FAA recognized Ultralight Organization (61.453 d)													
Year	# of existing instructors	Average instructor hrs spent writing letter	Average clerical hrs needed to process letter	Average instructor hrs to send certified copy to the FAA	Student instructor Wage	Clerical Wage	Postage	Cost of pilot, instructor, and clerical time	Mailing Costs	Total Undiscounted Cost			Discounted Cost
	a ¹	b	c	d	e	f	g	(a x b x e) + (a x c x f) + (a x d x e)	(3 x a x g)				
2004	700	0.08	0.17	0.08	\$34.65	\$17.93	\$0.37	\$6,134	\$777	\$6,911	0.93458		\$6,459
2005	600	0.08	0.17	0.08	\$34.65	\$17.93	\$0.37	\$5,258	\$666	\$5,924	0.87344		\$5,174
2006	0	0.08	0.17	0.08	\$34.65	\$17.93	\$0.37	\$0	\$0	\$0	0.81630		\$0
2007	0	0.08	0.17	0.08	\$34.65	\$17.93	\$0.37	\$0	\$0	\$0	0.76290		\$0
2008	0	0.08	0.17	0.08	\$34.65	\$17.93	\$0.37	\$0	\$0	\$0	0.71299		\$0
2009	0	0.08	0.17	0.08	\$34.65	\$17.93	\$0.37	\$0	\$0	\$0	0.66634		\$0
2010	0	0.08	0.17	0.08	\$34.65	\$17.93	\$0.37	\$0	\$0	\$0	0.62275		\$0
2011	0	0.08	0.17	0.08	\$34.65	\$17.93	\$0.37	\$0	\$0	\$0	0.58201		\$0
2012	0	0.08	0.17	0.08	\$34.65	\$17.93	\$0.37	\$0	\$0	\$0	0.54393		\$0
2013	0	0.08	0.17	0.08	\$34.65	\$17.93	\$0.37	\$0	\$0	\$0	0.50835		\$0
2004-2013								\$11,392	\$1,443	\$12,835			\$11,633
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003													
Notes:													
1) The FAA assumes that 100% of existing instructors will provide the FAA a certified copy of ultralight pilot records.													

Flight Training for Instructor Candidates

Applicants will be required to log up to 150 hours of flight time as a pilot, depending on the category and class that the applicant is requesting a rating for. The rule requires applicants to receive flight training on specified areas of operation and that, before taking the practical test, the instructor who trained the candidate provide a logbook endorsement certifying the applicant is ready for the practical test. Currently trade organizations require 5 hours of dual training and while the rule doesn't specify dual training hours we assume that instructor candidates will need about 15 hours of dual training to become qualified under the rule. Therefore, we estimate on average an applicant will need an additional 10 hours of flight training with an instructor before being ready for the practical test.

The out-of-pocket cost with respect to flight training costs for instructors include the cost of the training, which is estimated to be \$690, plus the additional costs of the instructor's time (\$28) needed for the logbook endorsement⁴⁵. The FAA estimated an average additional time cost of \$630⁴⁶ for student instructors. Therefore, the total individual costs for instructors are estimated to be \$1,348⁴⁷.

The total cost of flight training for student pilots who are not members of an FAA recognized ultralight organization is \$2.0 million (\$1.3 million, discounted), and the out-of-pocket costs are estimated to be \$759,000 over the next ten years as displayed in Table 23.

⁴⁵ $10 \times 0.08 \times \$34.65$.

⁴⁶ $(10 \times \$31.50) + (10 \times 0.92 \times \$31.50) + (10 \times 0.08 \times \$31.50)$.

⁴⁷ $\$690 + \$28 + \$630$.

Table 23. Flight Training Costs-New Instructors													
Year	# of new instructors	Average hrs spent in training	Average debriefing hrs	Average logbook hrs	Student Instructor Value of Time	Average cost of training	Cost of student instructor time needed for training	Cost of time needed for debriefing	Cost of training	Logbook Endorsees Time	Total Undiscounted Cost	Discounted Cost	Logbook Endorsers Time
	a ¹	b	c	d	e	f	(a x b x e)	(a x b x c x e)	(a x f)	a x b x d x e			a x b x d x \$34.65
2004	70	10	0.92	0.08	\$31.50	\$690	\$22,050	\$20,213	\$48,300	\$1,838	\$137,540	\$128,542	\$2,021
2005	70	10	0.92	0.08	\$31.50	\$690	\$22,050	\$20,213	\$48,300	\$1,838	\$134,587	\$117,554	\$2,021
2006	90	10	0.92	0.08	\$31.50	\$690	\$28,350	\$25,988	\$62,100	\$2,363	\$169,492	\$138,356	\$2,599
2007	90	10	0.92	0.08	\$31.50	\$690	\$28,350	\$25,988	\$62,100	\$2,363	\$166,176	\$126,775	\$2,599
2008	110	10	0.92	0.08	\$31.50	\$690	\$34,650	\$31,763	\$75,900	\$2,888	\$199,316	\$142,109	\$3,176
2009	110	10	0.92	0.08	\$31.50	\$690	\$34,650	\$31,763	\$75,900	\$2,888	\$195,775	\$130,453	\$3,176
2010	130	10	0.92	0.08	\$31.50	\$690	\$40,950	\$37,538	\$89,700	\$3,413	\$227,461	\$141,651	\$3,754
2011	130	10	0.92	0.08	\$31.50	\$690	\$40,950	\$37,538	\$89,700	\$3,413	\$223,806	\$130,257	\$3,754
2012	150	10	0.92	0.08	\$31.50	\$690	\$47,250	\$43,313	\$103,500	\$3,938	\$254,297	\$138,321	\$4,331
2013	150	10	0.92	0.08	\$31.50	\$690	\$47,250	\$43,313	\$103,500	\$3,938	\$250,614	\$127,400	\$4,331
2004-2013							\$346,500	\$317,625	\$759,000	\$28,875	\$1,959,064	\$1,321,418	\$31,763
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003													
Notes:													
1) The FAA assumes that 100% of new instructors will need flight training.													

Training Courses

The FAA assumes all instructors will purchase the training curriculum that has been developed by the ultralight associations and other organizations.⁴⁸ The following table estimates the cost to instructors to purchase pre-developed courses to be \$240,000 (\$191,000 million, discounted).

Table 24. Cost of Buying the Training Course from Associations				
Year	# of existing and new instructors	Average cost for a training course	Total Undiscounted Cost	Discounted Cost
	a ¹	b	a x b	
2004	770	\$100	\$77,000	\$71,963
2005	670	\$100	\$67,000	\$58,520
2006	90	\$100	\$9,000	\$7,347
2007	90	\$100	\$9,000	\$6,866
2008	110	\$100	\$11,000	\$7,843
2009	110	\$100	\$11,000	\$7,330
2010	130	\$100	\$13,000	\$8,096
2011	130	\$100	\$13,000	\$7,566
2012	150	\$100	\$15,000	\$8,159
2013	150	\$100	\$15,000	\$7,625
2004-2013			\$240,000	\$191,314
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				
Notes:				
1) The FAA assumes that approximately all of the instructors will buy their training courses from associations or other organizations.				

B.2.2.4.4. Practical Tests

Making Application to become an Instructor

The cost of applying to become an instructor is calculated by multiplying the population of existing and new instructors, by the amount of time it takes to fill out the application, and by the respective wage rate. Their product is then totaled. Table 25 displays the cost of applying to become an instructor will be \$80,000 (\$64,000, discounted) over the next ten years.

⁴⁸ Due to a lack of historical data, in the section above, we estimated that all pilots would take home study courses. However, to be conservative, we believe it prudent to include the costs of a small number of instructors who develop their own courses.

Table 25. Cost of Applying to Become an Instructor									
Year	New Instructors	Existing Instructors	Instructor hours	DPE hours	New Instructor wage	Existing Instructor Wage	DPE Wage	Undiscounted Cost	Discounted Cost
2004	70	700	0.25	0.25	\$31.50	\$34.65	\$100.00	\$8,365	\$7,818
2005	70	600	0.25	0.25	\$31.50	\$34.65	\$100.00	\$7,499	\$6,550
2006	90		0.25	0.25	\$31.50	\$34.65	\$100.00	\$2,959	\$2,415
2007	90		0.25	0.25	\$31.50	\$34.65	\$100.00	\$2,959	\$2,257
2008	110		0.25	0.25	\$31.50	\$34.65	\$100.00	\$3,616	\$2,578
2009	110		0.25	0.25	\$31.50	\$34.65	\$100.00	\$3,616	\$2,410
2010	130		0.25	0.25	\$31.50	\$34.65	\$100.00	\$4,274	\$2,661
2011	130		0.25	0.25	\$31.50	\$34.65	\$100.00	\$4,274	\$2,487
2012	150		0.25	0.25	\$31.50	\$34.65	\$100.00	\$4,931	\$2,682
2013	150		0.25	0.25	\$31.50	\$34.65	\$100.00	\$4,931	\$2,507
2004-2013								\$47,424	\$34,366
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003									
Notes:									
1) DPE woks with instructors on application.									
2) The FAA assumes that in the first two years DPEs will provide training for instructors.									

Practical Test for Instructor Candidates

Existing instructors will have to take the practical tests, as well as new instructors. The practical, or flight, test is given by a DPE and takes approximately three hours⁴⁹. We assume that new instructors would have become instructors with ultralight organizations in the absence of the rule. Since the FAA test takes as much time and costs as much as those given by the FAA recognized ultralight organizations, this requirement will not impose any additional costs on individuals applying to become new flight instructors with a sport pilot rating. However, the practical test will be a cost imposed by the rule on existing instructors since they will be required to take the FAA practical test to demonstrate their proficiency in flying light sport-aircraft.

Out-of-pocket costs with respect to the practical test include the cost of the test, which is estimated to be \$300, and the additional instructor time needed for the logbook endorsement, which is estimated to be \$8⁵⁰. Additionally, the FAA estimated time costs of \$107⁵¹ per instructor candidate and \$8⁵² per DPE.

⁴⁹ We assume the practical test for flight instructors will take the same amount of time as the practical test for sport pilots.

⁵⁰ $((5/60) \times \$100)$.

⁵¹ $((5/60) \times \$34.65) + (3 \times \$34.65)$.

⁵² $((5/60) \times \$100)$.

The total cost of the practical test is \$540,000 (\$489,000, discounted), and the out-of-pocket costs are estimated to be \$390,000 over the next ten years as displayed in Table 26.

An estimated 10% of those who take the practical test may fail it. Table 27 estimates the cost of an additional 2.5 hours training for the retest and the cost of reapplying to take the test (completing FAA form 8710-1) after failure and the cost of taking the test again. Out-of-pocket costs with respect to the practical test include the cost of the test, which is estimated to be \$300, and the additional instructor time needed for the logbook endorsement, which is estimated to be \$8⁵³. Additionally, the FAA estimated time costs of \$81⁵⁴ per instructor candidate.

The total cost of the practical test for instructors who fail it is \$57,000 (\$52,000, discounted), and the out-of-pocket costs are estimated to be \$39,000 over the next ten years as displayed in Table 27.

⁵³ $((5/60) \times \$100)$.

⁵⁴ $((5/60) \times \$34.65) + (0.25 \times \$34.65) + (2 \times \$34.65 \times 1)$.

Table 26. Practical Test Costs													
Year	# of existing instructors	Student instructor value of time	Instructor value of time	DPE Wage	Average hrs to take the practical test	Average cost of the practical test	Logbook Endorsees Time	Logbook Endorsers Time	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost	
	a	c	d	e	f	g	(a x 300 hours x b)	(a x 300 hours x c)	(a x d x f)	a x g			
2004	700	\$31.50	\$34.65	\$100.00	3	\$300	\$2,021	\$5,833	\$72,765	\$210,000	\$290,620	\$271,607	
2005	600	\$31.50	\$34.65	\$100.00	3	\$300	\$1,733	\$5,000	\$62,370	\$180,000	\$249,103	\$217,576	
2006	0	\$31.50	\$34.65	\$100.00	3	\$300	\$0	\$0	\$0	\$0	\$0	\$0	
2007	0	\$31.50	\$34.65	\$100.00	3	\$300	\$0	\$0	\$0	\$0	\$0	\$0	
2008	0	\$31.50	\$34.65	\$100.00	3	\$300	\$0	\$0	\$0	\$0	\$0	\$0	
2009	0	\$31.50	\$34.65	\$100.00	3	\$300	\$0	\$0	\$0	\$0	\$0	\$0	
2010	0	\$31.50	\$34.65	\$100.00	3	\$300	\$0	\$0	\$0	\$0	\$0	\$0	
2011	0	\$31.50	\$34.65	\$100.00	3	\$300	\$0	\$0	\$0	\$0	\$0	\$0	
2012	0	\$31.50	\$34.65	\$100.00	3	\$300	\$0	\$0	\$0	\$0	\$0	\$0	
2013	0	\$31.50	\$34.65	\$100.00	3	\$300	\$0	\$0	\$0	\$0	\$0	\$0	
2004-2013							\$3,754	\$10,833	\$135,135	\$390,000	\$539,722	\$489,183	
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003													

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Table 27. Cost of Retesting after Pilots or Instructors Fail the Practical Test																	
Year	# of existing instructors	Student instructor value of time	Instructor value of time	DPE Wage	Average hrs to take the practical test	Average cost of the practical test	Average hrs needed to reapply (form 8710- 1)	Average hrs needed to retrain	Logbook Endorsees Time	Logbook Endorsers Time	Cost of Reapplication (form 8710-1)	Cost of time to retrain	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost	
	a	b	c	d	e	f	g	h	(a x 5/60 hours x d)	(a x 5/60 hours x e)	(a x c x g)	(2 x a x c x h)	(a x c x e)	a x f			
2004	70	\$31.50	\$34.65	\$100.00	1.5	\$300	0.25	1.00	\$202	\$583	\$606	\$4,851	\$3,638	\$21,000	\$30,881	\$28,861	
2005	60	\$31.50	\$34.65	\$100.00	1.5	\$300	0.25	1.00	\$173	\$500	\$520	\$4,158	\$3,119	\$18,000	\$26,470	\$23,119	
2006	0	\$31.50	\$34.65	\$100.00	1.5	\$300	0.25	1.00	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2007	0	\$31.50	\$34.65	\$100.00	1.5	\$300	0.25	1.00	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2008	0	\$31.50	\$34.65	\$100.00	1.5	\$300	0.25	1.00	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2009	0	\$31.50	\$34.65	\$100.00	1.5	\$300	0.25	1.00	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2010	0	\$31.50	\$34.65	\$100.00	1.5	\$300	0.25	1.00	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2011	0	\$31.50	\$34.65	\$100.00	1.5	\$300	0.25	1.00	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2012	0	\$31.50	\$34.65	\$100.00	1.5	\$300	0.25	1.00	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2013	0	\$31.50	\$34.65	\$100.00	1.5	\$300	0.25	1.00	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2004-2013									\$375	\$1,083	\$1,126	\$9,009	\$6,757	\$39,000	\$57,351	\$51,980	
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003																	

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

B.2.2.4.5. Other Requirements for Instructors with Sport Pilot Rating

Renewal of Flight Instructor Certificate

Under section 61.427, flight instructor certificates must be renewed every two years in accordance with provision 61.197 of the CFR. This requirement will impose no additional costs to the instructors since it only serves to codify current practice.

Expiration of flight instructor certificate with sport pilot rating

Section 61.429 requires the holder to pass a practical test to reinstate a flight instructor certificate that has expired. There are no statistics to accurately determine how many certificates will expire and then be reinstated. Since the advent of the Flight Instructor Refresher Clinic, some of which instructors complete on-line in their spare time, there are few reinstatements. Therefore, we will assume that no one will allow their certificate to expire, and so, there are no costs to this provision.

Summary of Instructors with a Sport Pilot Rating

Over 10 years, the total cost for training, testing, and registering instructors with a sport pilot rating will be approximately \$3.1 million (\$2.3 million, discounted), of which \$1.6 million (\$1.2 million discounted) are out-of-pocket costs, as shown in Table S.3.

Table S.3. Costs for Training, Testing, and Registering Instructors with A Sport Pilot Rating (2004 -2013)	Total Cost Undiscounted	Total Cost Discounted	Out-of-pocket Cost Undiscounted	Out-of-pocket Cost Discounted
Table 20. Knowledge Test Costs	\$207,090	\$187,698	\$117,000	\$106,044
Table 21. Cost of Retesting after Instructors Fail the Knowledge Test	\$25,214	\$22,853	\$11,700	\$10,604
Table 22. Cost of Instructor and Clerical Time to Submit Records from an FAA recognized	\$12,835	\$11,633	\$1,443	\$1,308
Table 23. Flight Training Costs-New Instructors	\$1,959,064	\$1,321,418	\$759,000	\$507,064
Table 24. Cost of Buying the Training Course from Associations	\$240,000	\$191,314	\$240,000	\$191,314
Table 25. Cost of Applying to Become an Instructor	\$47,424	\$34,366	\$0	\$0
Table 26. Practical Test Costs	\$539,722	\$489,183	\$390,000	\$353,481
Table 27. Cost of Retesting after Pilots or Instructors Fail the Practical Test	\$57,351	\$51,980	\$39,000	\$35,348
Total	\$3,088,700	\$2,310,446	\$1,558,143	\$1,205,164
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				

B.2.3. Ground Instructors

The rule revises provisions relating to requirements for ground instructors in sections 61.213 and 61.215. Basic and advanced ground instructors currently must pass a knowledge test on aeronautical knowledge areas outlined in various provisions of the CFR (including aeronautical areas related to private pilot and recreational pilot for the basic ground instructor and for commercial pilots and air transport pilots for the advanced ground instructor). The rule requires that these instructors must pass a knowledge test on areas of aeronautical knowledge detailed in provision 61.309 of this rule. Many of the areas specified in part 61.309 overlap the other knowledge areas, but 61.309 adds some areas specific to sport pilot. The applicable regulations of this part relate to sport pilot privileges, limits, and flight operations and the use of applicable portions of the aeronautical information manual and FAA advisory circulars. All new ground instructors will have to take this new knowledge test. The FAA will have to revise the ground instructor knowledge test to incorporate questions relating to sport pilots. The cost of revising the ground instructor knowledge test will not be estimated as a cost of the rule, because the tests are normally updated regularly.

To be eligible for a basic or advanced ground instructor rating all new ground instructors will be expected (under provision 61.213) to learn the new knowledge areas pertaining to the sport pilot rule which are delineated in part 61.309 of the final rule. The FAA expects that prospective ground instructors will study an extra two hours to learn the new information pertaining to the sport pilot rule.

The FAA anticipates there will be about 1,867 new ground instructors per year who will have to study the new sport pilot knowledge areas. The value of the time spent by prospective ground instructors is estimated in Table 28, and sums to \$1.2 million (\$0.9 million, discounted).

Table 28. Ground Instructor Costs						
Year	Number of Basic Ground Instructors	Student instructor Value of Time	Hours of Study Time	Undiscounted Costs	Discount Factor	Discounted Costs
2004	1,867	\$31.50	2	\$117,621	0.93458	\$109,926
2005	1,867	\$31.50	2	\$117,621	0.87344	\$102,735
2006	1,867	\$31.50	2	\$117,621	0.81630	\$96,014
2007	1,867	\$31.50	2	\$117,621	0.76290	\$89,732
2008	1,867	\$31.50	2	\$117,621	0.71299	\$83,862
2009	1,867	\$31.50	2	\$117,621	0.66634	\$78,376
2010	1,867	\$31.50	2	\$117,621	0.62275	\$73,248
2011	1,867	\$31.50	2	\$117,621	0.58201	\$68,456
2012	1,867	\$31.50	2	\$117,621	0.54393	\$63,978
2013	1,867	\$31.50	2	\$117,621	0.50835	\$59,793
2004-2013				\$1,176,210		\$826,121
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						

B.2.4 Maintenance Provisions - Provisions 65.107, 91.319, 91.327, 91.409

FAA recognized ultralight organizations have requirements for their instructors to conduct an annual or 100 hour condition inspection on their training aircraft.

B.2.4.1. Rule

Under provision 91.327 of the rule aircraft that have a special airworthiness certificate or an experimental certificate will be required to have an annual condition inspection, unless they are used for training in which case they will have to have a 100-hour condition inspection. Experimental light-sport aircraft will be required under the operating limitations to have an annual condition inspection.

Individuals wishing to inspect their own experimental light sport aircraft will be required to earn a repairman certificate with an inspection rating. To earn this certificate, the individual is required to pass a sixteen (16) hour training course acceptable to the FAA on the inspection requirements, in addition to the other requirements of section 65.107.

An individual, who wishes to inspect and maintain a special light sport aircraft, will be required to earn a repairman certificate with a maintenance rating. To earn this certificate, the individual is required to pass a training course acceptable to the FAA on the maintenance requirements, in addition to the other requirements of section 65.107 of the rule. The length of the training course will vary depending on the rating as follows: to receive a rating to work on airplanes the course requires 120 hours, weight shift control and powered parachutes 104 hours and lighter than air and gliders 80 hours.

Currently, the FAA recognized ultralight organizations require their members that are operating under the training exemptions to perform 100-hour maintenance on their training vehicles. These requirements are thought to be similar to the maintenance inspections that will be required under the rule. However, there are currently no training programs designed to prepare repairmen to inspect light-sport aircraft. The requirement for specific training for light-sport aircraft maintenance and inspections are new requirements that do not currently exist.

B.2.4.2. Assumptions

- Aircraft used for flight instruction, for compensation or hire, will be required to have a 100-hour condition inspection. The estimated cost of such an inspection is \$250 - \$300 per aircraft. Depending on how frequently these aircraft are flown, the training aircraft may require more than one condition inspection per year. The cost for an annual inspection or a 100-hour inspection is assumed by the FAA to be \$275.
- In 2004, 25 % of new aircraft will be factory built; in 2005, 50% of new aircraft will be factory built; and from 2006 to 2013, 75% of new aircraft will be factory built.
- Of those who own factory built aircraft 20% of them will take an 80-hour maintenance course when they buy their new airplane. The rest of those who own factory built will have an appropriately certificated mechanic or repairman conduct the annual or 100 hour condition inspection.

- The estimated costs of courses to become a repairman with a maintenance rating is: \$3000 for the 120 hour course, \$2600 for the 104 hour course, and \$2000 for the 80-hour course.
- The 20% who take the course will do it for one of three reasons: they are instructors and they fly their aircraft enough that they have to do a 100-hour condition inspection more than once a year; it's too difficult to take aircraft to get inspected, or they like to work on airplanes.
- Those who obtain light-sport repairman certificates with a maintenance rating will also be able to provide maintenance inspections on light-sport aircraft that are owned by others and can therefore earn money that could defray the costs of acquiring the certificate. The analysis does not include the possible income to those who decide to offer their services as repairmen.
- Those with experimental light-sport aircraft will be allowed to inspect their own aircraft with a light-sport repairman certificate with an inspection rating. The estimated cost to acquiring this certificate is \$500, which is less than the estimated average cost to pay another repairman for two annual condition inspection (\$250-\$300 per year). The FAA assumes in this analysis that all owners of experimental light-sport aircraft will obtain a light-sport repairman certificate with an inspection rating (16-hour course at an estimated cost of \$500) because it is less costly than paying for a condition inspection every year.

B.2.4.3. Analysis of Costs of Maintenance Provisions

Table 29 indicates the estimated cost of inspections by appropriately certificated mechanic or repairman for those who decide not to take the courses but to have their light-sport aircraft inspected. We estimate that 80% of new factory-built aircraft will be taken to an appropriately certificated mechanic or repairman for such inspections. Some of these may be used in training. For those that are used in training, the FAA assumes that these aircraft are flown on average 100 hours per year. Therefore 80% of all new factory-built aircraft will receive an inspection once a year at a cost of \$275. The total

estimated cost of annual inspections by appropriately certificated mechanic or repairman is \$15.8 million (\$9.4 million discounted).

Table 29. Cost of Inspections at a Repair Shop						
Year	Factory Built Aircraft	Factory built aircraft taken to an appropriately certificated mechanic or repairman	Impacted	Total Inspection Costs	Discount factor	Discounted Cost
	a	b = a x 80%	c = cumulative b with a 1 year lag	c x \$275		
2004	500	400	0	\$0	0.9346	\$0
2005	1,000	800	400	\$110,000	0.8734	\$96,078
2006	1,815	1,452	1,200	\$330,000	0.8163	\$269,378
2007	1,815	1,452	2,652	\$729,300	0.7629	\$556,379
2008	2,618	2,094	4,104	\$1,128,600	0.7130	\$804,676
2009	2,033	1,626	6,198	\$1,704,450	0.6663	\$1,135,747
2010	2,348	1,878	7,824	\$2,151,600	0.6227	\$1,339,908
2011	2,348	1,878	9,702	\$2,668,050	0.5820	\$1,552,829
2012	2,663	2,130	11,580	\$3,184,500	0.5439	\$1,732,157
2013	2,663	2,130	13,710	\$3,770,250	0.5083	\$1,916,604
Total				\$15,776,750		\$9,403,758
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						

Table 30 displays the estimated cost of those training to be a repairman with an inspection rating. This includes the cost to take a 16-hour course for all those who own experimental light-sport aircraft as well as the value of time spent on the course. The FAA estimates that over 10 years, 19,800 sport pilots will take the repairmen course. The 19,800 was estimated as follows: in 2004 and 2005, all existing and new pilots minus the sport pilots who purchased factory-built aircraft will take the repairmen course. Thereafter, all sport pilots who purchased kit-built aircraft will take the course. The total estimated cost is about \$19.9 million (\$16.4 million discounted), of which \$9.9 million represents the out-of-pocket costs.

Table 31 indicates the cost incurred by those who train to be repairmen with a maintenance rating. The FAA assumes that 20% of the pilots who own factory built aircraft take a maintenance course when they buy their new airplane at a weighted average cost of \$2,816. We therefore estimated the total number of owners of factory built aircraft who would take the course as 20% of the number of factory built aircraft

(column b in Table 31). Some of these may be sport pilots and some will be instructors. The weighted average cost of the course was derived using the assumption that 60% would train to airplane class requirements at a cost of \$3,000, 36% would train to weight shift control or powered parachute class requirements at a cost of \$2,600 and 4% would train to lighter than air or glider class requirements at a cost of \$2,000.

In some years (2004, 2005 and 2008) we assume no sports pilots take the course to become certified with a maintenance rating. This is because of the assumption that 20% of new owners of factory-built aircraft would opt to obtain the repairman certificate (with a maintenance rating) while the remainder would take their craft to a repair station. We assumed that instructors would be more likely to train for the maintenance rating than pilots so in years when the number of instructors exceeded the number of (new) owners of factory built aircraft, we assumed that 20% of factory-built aircraft (i.e. all those aircraft whose owners would acquire the maintenance rating) would all be instructor owned. The remainder of instructors would take their craft to a repair shop and we assumed that all sport pilots in that year would purchase experimental aircraft and therefore take the repairman course with an inspection rating.

Table 31 indicates that cost to pay for training incurred by those owners taking the repairman course with a maintenance rating will be an estimated \$11.2 million over ten years.

Table 31 also indicates the value of the time to take the course by estimating the number of instructors who take the course and multiplying that by the average number of hours spent on the course times the instructor wage rate. The number of instructors corresponds to the lesser of column f in Table 30 and column b in Table 31. Similarly, the value of time of the sport pilot taking the course is estimated as the number of sport pilots taking the course times the average number of hours of the course times the hourly wage rate of the sport pilot.

The value of time to earn the repairman certificate is estimated as \$14.8 million, over the next ten years. Total costs for this requirement sum to \$26.0 million (\$17.2 million, discounted), of which, \$11.2 million represent the out-of-pocket costs (as shown in table 31) over the next ten years.

Table 30. Cost of Inspection Repairmen Obtaining a Repairmen certificate with an Inspection Rating													
Year	Existing Pilots	New pilots	Existing sport pilot replacing aircraft	No of existing Flt. Instructor/New Replacement Aircraft Impacted	New instructors/ New Aircraft	Instructor Purchased Factory-Built Aircraft	Sport Pilots Who Purchas Factory-Built Aircraft ²	Sport Pilots Who Purchas Kit Built Aircraft ²	Sport Pilots Taking Inspector Repairman Course ¹	Cost of the Course	Value of time spent on course	Total Cost	Discounted Cost
	a	b	c	d	e	f = d + e	g = percentage of aircraft that are factory built x (b + c + d + e) - f	h = percentage of aircraft that are kit built x (b + c + d + e)	i = a + b - g in 2004 and 2005 and h thereafter	i x 500	i x 16 x 31.50		
2004	7,000	400	1,400	130	70	200	300	1,500	7,100	\$3,550,000	\$3,578,400	\$7,128,400	\$6,662,056
2005	7,000	400	1,400	130	70	200	800	1,000	6,600	\$3,300,000	\$3,326,400	\$6,626,400	\$5,787,754
2006	0	800	1,400	130	90	220	1,595	605	605	\$302,500	\$304,920	\$607,420	\$495,836
2007	0	800	1,400	130	90	220	1,595	605	605	\$302,500	\$304,920	\$607,420	\$463,398
2008	0	1,200	1,400	780	110	890	1,728	873	873	\$436,250	\$439,740	\$875,990	\$624,569
2009	0	1,200	1,400	0	110	110	1,923	678	678	\$338,750	\$341,460	\$680,210	\$453,253
2010	0	1,600	1,400	0	130	130	2,218	783	783	\$391,250	\$394,380	\$785,630	\$489,251
2011	0	1,600	1,400	0	130	130	2,218	783	783	\$391,250	\$394,380	\$785,630	\$457,244
2012	0	2,000	1,400	0	150	150	2,513	888	888	\$443,750	\$447,300	\$891,050	\$484,672
2013	0	2,000	1,400	0	150	150	2,513	888	888	\$443,750	\$447,300	\$891,050	\$452,965
Total										\$9,900,000	\$9,979,200	\$19,879,200	\$16,370,997

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Notes:

1) This is the number of experimental aircraft.

2) In 2004, 25% of all newly purchased aircraft will be factory built. In 2005, 50% of all newly purchased aircraft will be factory built. Thereafter, 75% of all newly purchased aircraft will be factory built.

Table 31. Cost of Obtaining a Repairmen Certificate with a Maintenance Rating							
Year	Owners of Factory Built Aircraft Taking Course ¹	Cost of Course	Instuctro taking course ²	Sport Pilot Taking Course	Value of Time Taking Course	Total Cost	Discounted Cost
a	b	b x \$2816	c	d = b - c	(c x 113 x \$34.65) + (d x 113 \$31.50)		
2004	100	\$281,600	100	0	\$391,545	\$673,145	\$629,107
2005	200	\$563,200	200	0	\$783,090	\$1,346,290	\$1,175,902
2006	363	\$1,022,208	220	143	\$1,370,408	\$2,392,616	\$1,953,087
2007	363	\$1,022,208	220	143	\$1,370,408	\$2,392,616	\$1,825,315
2008	524	\$1,475,584	524	0	\$2,051,696	\$3,527,280	\$2,514,902
2009	407	\$1,146,112	110	297	\$1,487,871	\$2,633,983	\$1,755,134
2010	470	\$1,323,520	130	340	\$1,719,239	\$3,042,759	\$1,894,877
2011	470	\$1,323,520	130	340	\$1,719,239	\$3,042,759	\$1,770,913
2012	533	\$1,500,928	150	383	\$1,950,606	\$3,451,534	\$1,877,406
2013	533	\$1,500,928	150	383	\$1,950,606	\$3,451,534	\$1,754,585
Total		\$11,159,808			\$14,794,706	\$25,954,514	\$17,151,228
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003							
Notes:							
1) 20% of purchasers of factory built aircraft (i.e., 20% of column a) in table 29).							
2) Lessor of column a in table 30 and column b in table 31.							

Repairmen will have to complete Form 8610-2 in order to apply for the inspection and maintenance repairman certificate (light-sport aircraft). The FAA estimates that an applicant will need no more than 10 minutes to complete the form with either an examiner or an aviation safety inspector. The form will be printed and mailed to the registry. The cost to complete form 8610-2 is based on the number of pilots taking the inspector repairmen course and the number of pilots taking the maintenance repairmen course. The FAA estimates that over 10 years, 19,213 pilots will take the inspector repairmen course and 3,963 will take the maintenance repairmen course (see tables 30 and 31 to see how these numbers were derived). Over the next ten years this cost will be approximately \$234,000 (\$187,000, discounted), as displayed in Table 32.

Table 32. Cost of Submitting Form 8610-2										
Part 65										
Year	Sport Pilots taking the course for a repairman certificate with an inspection rating ¹	Sport Pilots taking the course for a repairman certificate with a maintenance rating	Hours	Pilot wage	Cost for pilots	Sport Pilot Instructors taking the course for a repairman certificate with a maintenance rating	Instructor wage	Cost for instructors	Undiscounted Cost	Discounted Cost
	a	b ²	c	d	(a + b) x c x d	e ²	f	((a + b) x c x d) + (c x e x f)		
2004	7,100	0	0.17	\$31.50	\$37,275	100	\$34.65	\$37,853	\$75,128	\$70,213
2005	6,600	0	0.17	\$31.50	\$34,650	200	\$34.65	\$35,805	\$70,455	\$61,538
2006	605	143	0.17	\$31.50	\$3,927	220	\$34.65	\$5,198	\$9,125	\$7,448
2007	195	143	0.17	\$31.50	\$1,775	220	\$34.65	\$3,045	\$4,820	\$3,677
2008	328	0	0.17	\$31.50	\$1,722	524	\$34.65	\$4,748	\$6,470	\$4,613
2009	523	297	0.17	\$31.50	\$4,305	110	\$34.65	\$4,940	\$9,245	\$6,161
2010	818	340	0.17	\$31.50	\$6,080	130	\$34.65	\$6,830	\$12,910	\$8,040
2011	818	340	0.17	\$31.50	\$6,080	130	\$34.65	\$6,830	\$12,910	\$7,514
2012	1,113	383	0.17	\$31.50	\$7,854	150	\$34.65	\$8,720	\$16,574	\$9,015
2013	1,113	383	0.17	\$31.50	\$7,854	150	\$34.65	\$8,720	\$16,574	\$8,426
2004-2013					\$111,521			\$122,689	\$234,210	\$186,643
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003										
Notes:										
1) Column i in Table 30.										
2) Column d in Table 31.										
2) Column c in Table 31.										

Part 43.11 of the CFR prescribes maintenance record entries after any inspection performed in accordance with Part 91 (and other parts). Part 91.319 will require that experimental light-sport aircraft being used for instruction have a 100 hour inspection. Part 91.327 will require that special light-sport aircraft have a 12-month condition inspection. Therefore, part 43.11 would require logbook endorsements of these aircraft because the inspection is performed in accordance with Part 91. Logbook endorsements are also required by the operating limitations after a condition inspection on an experimental aircraft. Table 33 provides the estimates of the costs of logbook endorsements for the inspections⁵⁵. The FAA estimates that over 10 years, between 5,600 and 12,700 sport pilots with kit-built aircraft, 5,130 sport pilots with factory-built aircraft, and 1,784 instructors with manufactured aircraft will need logbook endorsements. Over the next ten years, costs sum up to \$274,000 (\$192,000, discounted).

⁵⁵ This cost excludes repair shop logbook endorsements.

Table 33. Cost of Logbook Endorsement															
Year	Existing pilots	Existing pilots replacing aircraft	Pool of non-retired experimental aircraft	Kit-built A/C purchased previous year	Cumulative Kit-built	Sport Pilots with Kit Built Aircraft	Value of Time for Sport Pilots with Kit Built Aircraft	Sport pilots who purchase factory built aircraft ¹	Sport Pilots with Factory-Built Aircraft	Value of Time for Sport Pilots with Factory-Built Aircraft	Instructors with Factory-Built Aircraft ²	Cumulative Instructors with Factory-Built Aircraft	Value of Time for Instructors with Factory-Built Aircraft	Total Costs	Discounted Costs
	a	b	c	d	e	f = c + e	f x (5/60) x \$31.50	g	h = cumulative g	h x (5/60) x \$31.50	i	j = cumulative i	i x (5/60) x \$34.65		
2004	7,000	1,400	5,600	0	0	5,600	\$14,700	0	0	\$0	0	0	\$0	\$14,700	\$13,738
2005	7,000	1,400	11,200	1,500	1,500	12,700	\$33,338	0	0	\$0	100	100	\$289	\$33,626	\$29,370
2006		1,400	9,800	1,000	2,500	12,300	\$32,288	0	0	\$0	200	300	\$578	\$32,865	\$26,828
2007		1,400	8,400	605	3,105	11,505	\$30,201	143	143	\$375	220	520	\$635	\$31,211	\$23,811
2008		1,400	7,000	605	3,710	10,710	\$28,114	143	286	\$751	220	740	\$635	\$29,500	\$21,033
2009		1,400	5,600	872	4,582	10,182	\$26,728	0	286	\$751	524	1264	\$1,513	\$28,992	\$19,318
2010		1,400	4,200	677	5,259	9,459	\$24,830	297	583	\$1,530	110	1374	\$318	\$26,678	\$16,614
2011		1,400	2,800	782	6,041	8,841	\$23,208	340	923	\$2,423	130	1504	\$375	\$26,006	\$15,136
2012		1,400	1,400	782	6,823	8,223	\$21,585	340	1,263	\$3,315	130	1634	\$375	\$25,276	\$13,749
2013		1,400	0	887	7,710	7,710	\$20,239	383	1,646	\$4,321	150	1784	\$433	\$24,993	\$12,705
2004 - 2013							\$255,229			\$13,466			\$5,151	\$273,846	\$192,301
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003															
Notes:															
1) Column d in table 31 with a 1 year lag.															
2) Column c in table 31 with a 1 year lag.															

Provision §91.327 that unless otherwise authorized by the FAA, the owner or operator must comply with all safety directives. At this time it is unknown how many safety directives might be issued. Therefore, the FAA cannot quantify the costs of requiring owners and operators to comply with safety directives.

Summary of Maintenance Cost and Cost to Train Repairmen

Over 10 years, total maintenance costs will be approximately \$62.1 million (\$43.3 million, discounted), of which \$36.8 million (\$24.9 million discounted) are out-of-pocket costs, as shown in Table S.4.

Table S.4. Maintenance Costs (2004 -2013)	Total Cost Undiscounted	Total Cost Discounted	Out-of-pocket Cost Undiscounted	Out-of- pocket Cost Discounted
Table 29. Cost of Inspections at a Repair Shop	\$15,776,750	\$9,403,758	\$15,776,750	\$9,403,758
Table 30. Cost of Inspection Repairmen Obtaining a Repairmen certificate with an Inspection Rating	\$19,879,200	\$16,370,997	\$9,900,000	\$8,152,887
Table 31. Cost of Obtaining a Repairmen Certificate with a Maintenance Rating	\$25,954,514	\$17,151,228	\$11,159,808	\$7,359,059
Table 32. Cost of Submitting Form 8610-2	\$234,210	\$186,643	\$0	\$0
Table 33. Cost of Logbook Endorsement	\$273,846	\$192,301	\$0	\$0
Total	\$62,118,520	\$43,304,927	\$36,836,558	\$24,915,704
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				

From 2004 to 2013, total private sector costs, which include cost of aircraft inspection, certification, and registration, costs for training, testing, and registering sport pilots, costs for training, testing, and registering instructors with a sport pilot rating, ground instructors, and maintenance costs (Tables S.1 through S.4), will be approximately \$202.1 million (\$144.5 million, discounted), of which \$139.5 million (\$98.9 million, discounted) represent the out-of-pocket costs.

B.3. Government Costs

From 2004 to 2013, total government costs of the final rule will be approximately \$18.9 million (\$13.9 million, discounted). Total government costs include: 1) aircraft certification costs; 2) pilot and instructor qualification costs; 3) maintenance provisions costs, and 4) miscellaneous costs.

B.3.1. Aircraft Certification

Aircraft certification includes the cost of working with industry to develop consensus standards, the cost of training Designated Airworthiness Representatives (DAR's), the cost of appointing, supervising and renewing DAR's, and the cost of aircraft registration which will include the cost of registering aircraft and assigning n-numbers. To work with industry to develop the consensus standards, the FAA estimates that 2 Government employees will be needed in the first year and 0.25 employees thereafter. The estimated cost per employee is on an annual basis, which includes fringe benefits, is \$117,479⁵⁶. Over 10 years, the cost of working with industry to develop the consensus standards will be approximately \$499,000 (\$398,000, discounted), as shown in Table 34.

⁵⁶ \$88,697 (Salary of a GS-14 step 5 for Washington, DC) x 1.3245 (fringe benefits)

Table 34. Cost of Working with Industry to Develop the Consensus Standards				
Years	Number of Employees	Annual Salary ¹	Total Undiscounted Cost	Total Discounted Costs
2004	2.00	\$117,479	\$234,958	\$219,592
2005	0.25	\$117,479	\$29,370	\$25,652
2006	0.25	\$117,479	\$29,370	\$23,975
2007	0.25	\$117,479	\$29,370	\$22,406
2008	0.25	\$117,479	\$29,370	\$20,941
2009	0.25	\$117,479	\$29,370	\$19,569
2010	0.25	\$117,479	\$29,370	\$18,289
2011	0.25	\$117,479	\$29,370	\$17,093
2012	0.25	\$117,479	\$29,370	\$15,974
2013	0.25	\$117,479	\$29,370	\$14,929
2004-2013			\$499,287	\$398,419
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				
Notes:				
1) \$117,479 = \$88,697 (2002 Salary of a GS-14 step 5 for Washington, DC) x 1.3245 (fringe benefits).				

In order to certify light-sport aircraft, a Designated Airworthiness Representative (DAR) must be appointed, trained, supervised and renewed. Some of the DARs will require minimal training as they are already authorized as DARs on similar aircraft. Others will require more extensive training. The FAA will need to spend time appointing and supervising DAR's. The costs are expected to be the same whether a Manufacturing Inspection District Office (MIDO) or a Flight Standards District Office (FSDO) performs the function. The following cost estimates were obtained from a MIDO, but are expected to be representative of the costs that will be incurred by a FSDO. A Designee Process Coordinator (DPC), at the FG-13 level, will need to spend one hour preparing and forwarding the application package. The DPC and the Evaluation Panel, at the Manufacturing Inspection District Office (MIDO) consisting of different personnel at the FG-13, FG-14, and FG-15 levels, will spend 8 hours reviewing and coordinating the DAR appointment process; all but half an hour of this time will be accomplished by FG-13's, with the balance being split between a FG-14 and a FG-15. Four more hours are then spent at the Manufacturing Inspection Office (MIO), 3½ hours spent by an FG-14 and ½ an hour by a FG-15. The FAA will provide oversight of each DAR, taking 27.4 hours; this oversight will be accomplished by a FG-13, and includes the annual review, maintaining records, reviewing documentation, and submitting hard copies of their records. Finally, a FG-13 will spend 2 hours on DAR renewal activities. Total costs,

over ten years, sum to \$2.2 million (\$1.7 million, discounted) and can be found in Table 35.

Table 35. Appointing, Supervising, and Renewing a DAR																
Year	FG-13 wage rate	FG-14 wage rate	FG-15 wage rate	Initial number of DAR's applying	Number of DAR's reapplying	DAR's to be supervised	DAR's renewals	DPC prepares application package	FG-13 appointment activities	FG-14 appointment activities	FG-15 appointment activities	FG-13 oversight activities	FG-13 renewal activities	Undiscounted Costs	Discount Factor	Discounted Costs
2004	\$47.80	\$56.48	\$66.44	300		300	0	\$48	\$370	\$205	\$42	\$1,310	\$96	\$592,227	0.9346	\$553,483
2005	\$47.80	\$56.48	\$66.44	0		300	300	\$48	\$370	\$205	\$42	\$1,310	\$96	\$421,561	0.8734	\$368,207
2006	\$47.80	\$56.48	\$66.44	0		300	0	\$48	\$370	\$205	\$42	\$1,310	\$96	\$392,883	0.8163	\$320,710
2007	\$47.80	\$56.48	\$66.44	150	0	50	0	\$48	\$370	\$205	\$42	\$1,310	\$96	\$165,152	0.7629	\$125,994
2008	\$47.80	\$56.48	\$66.44	30	0	50	50	\$48	\$370	\$205	\$42	\$1,310	\$96	\$90,194	0.7130	\$64,307
2009	\$47.80	\$56.48	\$66.44	30	50	50	50	\$48	\$370	\$205	\$42	\$1,310	\$96	\$123,418	0.6663	\$82,239
2010	\$47.80	\$56.48	\$66.44	30	10	50	50	\$48	\$370	\$205	\$42	\$1,310	\$96	\$96,839	0.6227	\$60,307
2011	\$47.80	\$56.48	\$66.44	30	27	50	50	\$48	\$370	\$205	\$42	\$1,310	\$96	\$108,135	0.5820	\$62,936
2012	\$47.80	\$56.48	\$66.44	30	13	50	50	\$48	\$370	\$205	\$42	\$1,310	\$96	\$98,833	0.5439	\$53,758
2013	\$47.80	\$56.48	\$66.44	30	19	50	50	\$48	\$370	\$205	\$42	\$1,310	\$96	\$102,820	0.5083	\$52,268
2004-2013														\$2,192,063		\$1,744,209
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003																

Existing pilots, new pilots, existing instructors, and new instructors must register their aircraft. The FAA estimates that the cost per aircraft registration is approximately \$31.17. This cost includes the cost to assign a registration number and the cost for a certificate of aircraft registration. Over 10 years, the cost of aircraft registration will be approximately \$1.3 million (\$942,000, discounted), as shown in Table 36.

Table 36. Cost of Aircraft Registration				
Year	# of aircraft ¹	Registration Cost per Aircraft ²	Undiscounted Cost	Discounted Cost
2004	8,170	\$31.17	\$254,659	\$237,999
2005	8,070	\$31.17	\$251,542	\$219,706
2006	2,420	\$31.17	\$75,431	\$61,574
2007	2,420	\$31.17	\$75,431	\$57,546
2008	2,840	\$31.17	\$88,523	\$63,116
2009	2,840	\$31.17	\$88,523	\$58,986
2010	3,260	\$31.17	\$101,614	\$63,280
2011	3,260	\$31.17	\$101,614	\$59,140
2012	3,680	\$31.17	\$114,706	\$62,392
2013	3,680	\$31.17	\$114,706	\$58,311
2004-2013			\$1,266,749	\$942,052
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				
Notes:				
1) Includes aircraft of existing pilots, new pilots, existing instructors, and new instructors.				
2) $\$31.17 = (\$11.75 + \$18.75) \times (1.1177 / 1.0937)$. (Cost to assign a registration number + cost for a certificate of aircraft registration) \times (Constant dollars conversion factor based on GDP (chained) price index).				

The FAA estimates there will be approximately 15 requests for special registration numbers annually. It takes approximately one hour for a GS-10 employee to process each request. This cost will be approximately \$5,000 (\$3,000, discounted), over the next ten years as shown in Table 37.

Table 37. Cost of Assigning a Special Number (Part 47)					
Year	# of assignments	Hours	GS-10 Wage	Undiscounted Cost	Discounted Cost
2004	15	1.00	\$30.52	\$458	\$428
2005	15	1.00	\$30.52	\$458	\$400
2006	15	1.00	\$30.52	\$458	\$374
2007	15	1.00	\$30.52	\$458	\$349
2008	15	1.00	\$30.52	\$458	\$326
2009	15	1.00	\$30.52	\$458	\$305
2010	15	1.00	\$30.52	\$458	\$285
2011	15	1.00	\$30.52	\$458	\$266
2012	15	1.00	\$30.52	\$458	\$249
2013	15	1.00	\$30.52	\$458	\$233
2004-2013				\$4,579	\$3,216
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003					

The FAA estimates they will process 10 registration certificates a year to certify them as a true copy of identification and it will take a GS-10 employee one hour to process each request. This cost will be approximately \$3,000 (\$2,000, discounted), over the next ten years, as shown in Table 38.

Table 38. Cost to Process the Certification as to True Copy of Identification Form (Part 47)					
Year	# of Certificates issued	Hours	GS-10 Wage	Undiscounted Cost	Discounted Cost
2004	10	1.00	\$30.52	\$305	\$285
2005	10	1.00	\$30.52	\$305	\$267
2006	10	1.00	\$30.52	\$305	\$249
2007	10	1.00	\$30.52	\$305	\$233
2008	10	1.00	\$30.52	\$305	\$218
2009	10	1.00	\$30.52	\$305	\$203
2010	10	1.00	\$30.52	\$305	\$190
2011	10	1.00	\$30.52	\$305	\$178
2012	10	1.00	\$30.52	\$305	\$166
2013	10	1.00	\$30.52	\$305	\$155
2004-2013				\$3,052	\$2,144
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003					

Over 10 years, it will cost the government approximately \$4.0 million (\$3.1 million, discounted) to certify light-sport aircraft as displayed in Table S.5.

Table S.5. Aircraft Certification Costs (2004 -2013)	Undiscounted Cost	Discounted Cost
Table 34. Cost of Working with Industry to Develop the Consensus Standards	\$499,287	\$398,419
Table 35. Appointing, Supervising, and Renewing a DAR	\$2,192,063	\$1,744,209
Table 36. Cost of Aircraft Registration	\$1,266,749	\$942,052
Table 37. Cost of Assigning a Special Number (Part 47)	\$4,579	\$3,216
Table 38. Cost to Process the Certification as to True Copy of Identification Form (Part 4)	\$3,052	\$2,144
Total	\$3,965,729	\$3,090,040
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003		

B.3.2. Pilot and Instructor Qualifications

The airmen certification section of the rule will cause the government to incur costs to:

- Appoint, supervise and renew sport pilot DPE's;
- Develop practical test and knowledge tests for sport pilots and flight instructors with sport pilot rating;
- Train sport pilot DPE's;
- Update advisory circulars, orders and manuals pertaining to airman certification;
- Design and develop an airmen certification and rating application (ACRA) system and redesign 8710-1 for applicants for sport pilot and flight instructor (sport pilot) certification;
- Review and process pilot and instructor applications;
- Register airmen;

The costs of performing the first three functions are not included in the paragraphs below because these functions are expected to be performed by the National Program Office.

Update advisory circulars, orders and manuals pertaining to airman certification

The FAA will have to update the General Aviation Inspector's Handbook; probably by adding an appendix on sport pilot. This task is estimated to take 220 hours. A GS-14 level employee will draft a handbook, perform a review of the handbook and an employee in the chief counsel office will also review the handbook. A GS-15 level

employee will give an oral briefing of the handbook. A GS-14 and a GS-15 will review the handbook. This cost occurs in 2004, and the FAA estimates this will cost \$13,000 (discounted, \$12,000), as shown in Table 39.

Table 39. Drafting of General Aviation Inspector's Handbook											
Year	GS-14 wage	GS-15 wage	Handbook Drafting	AFS-100 Review	Oral Briefings	AFS Main Office Review	AGC Main Office Review	Total GS-14 hours	Total GS-15 hours	Undiscounted Costs	Discounted Costs
2004	\$56.48	\$66.44	120	40	10	10	40	205	15	\$12,575	\$11,752
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003											

The FAA will also have to add an appendix on sport pilots to the Pilot Examiner's Handbook. The FAA estimates that this task will require the same amount of time from the same level personnel as will be required for updating the General Aviation Inspector's Handbook. This cost occurs in 2004, and the FAA estimates this will cost \$13,000 (discounted, \$12,000), as shown in Table 40.

Table 40. Drafting of Pilot Examiner's Handbook											
Year	GS-14 wage	GS-15 wage	Handbook Drafting	AFS-100 Review	Oral Briefings	AFS Main Office Review	AGC Main Office Review	Total GS-14 hours	Total GS-15 hours	Undiscounted Costs	Discounted Costs
2004	\$56.48	\$66.44	120	40	10	10	40	205	15	\$12,575	\$11,752
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003											

Development of Airmen Certification and Rating Application (ACRA) System for Sport Pilot

The FAA plans to modify the airmen certification application form 8710-1 to tailor it to applicants for sport pilot and sport pilot flight instructor certification and allow entry of information through ACRA. The FAA is currently gathering, designing and developing ACRA sport pilot paths. This will allow the application form to be completed electronically. A contractor is working to first develop a stand-alone program on a CD until the web-based application can be completed. As indicated in Table 41 it will take contractors up to 1,090 hours to develop the stand-alone program, up to 540 hours to develop the web-based program and up to 10 hours to change the 8710-1 form. The total cost of designing and developing the ACRA program for sport pilot is \$69,900 and the

cost to revise the 8710-1 form is \$470. This cost occurs in 2004, and the FAA estimates this will cost \$70,000 (discounted, \$66,000), as shown in Table 41.

Table 41. Update of the ACRA Program						
Year	Wage Rate - M Level	Wage Rate - O Level	Design & Develop ACRA Program		Revise 8710-1 form	Undiscounted Costs
			Hours - M Level	Hours - O Level	Hours - M Level	
2004	\$47.36	\$33.84	1,090	540	10	\$70,370
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						

The FAA estimates it will take a GS-10 employee approximately ten minutes to review and process original pilot applications. This cost will be approximately \$151,000 (\$119,000, discounted), over the next ten years, as shown in Table 42.

Table 42. Cost of Reviewing and Processing Original Pilot and Flight Instructor Applications (Part 61)						
Year	# of pilot applications ¹	# of instructor applications	Hours	GS-10 Wage	Undiscounted Cost	Discounted Cost
2004	8,100	770	0.17	\$30.52	\$45,126	\$42,173
2005	8,000	670	0.17	\$30.52	\$44,108	\$38,526
2006	800	90	0.17	\$30.52	\$4,528	\$3,696
2007	800	90	0.17	\$30.52	\$4,528	\$3,454
2008	1,200	110	0.17	\$30.52	\$6,665	\$4,752
2009	1,200	110	0.17	\$30.52	\$6,665	\$4,441
2010	1,600	130	0.17	\$30.52	\$8,801	\$5,481
2011	1,600	130	0.17	\$30.52	\$8,801	\$5,122
2012	2,000	150	0.17	\$30.52	\$10,938	\$5,950
2013	2,000	150	0.17	\$30.52	\$10,938	\$5,560
2004-2013					\$151,097	\$119,155
Notes:						
1) Includes new pilots, existing pilots and existing instructors because existing instructors will become certified first as a pilot before becoming certified as an instructor. Existing instructors will become instructors in the same year the become certified as a pilot.						
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						

Over 10 years, the cost of airmen registration will be approximately \$138,000 (\$108,000, discounted), as shown in Table 43. This cost was obtained by multiplying the number of airmen, which includes existing pilots, new pilots, existing instructors, and new instructors, by the registration cost per airman.

Table 43. Cost of Airmen Registration					
Years	Number of Airmen ^{1,2}	Registration Cost per Airman ³	Total Undiscounted Cost	Discount Factor	Total Discounted Costs
2004	8,170	\$4.84	\$39,576	0.9346	\$36,987
2005	8,070	\$4.84	\$39,091	0.8734	\$34,142
2006	890	\$4.84	\$4,311	0.8163	\$3,519
2007	890	\$4.84	\$4,311	0.7629	\$3,289
2008	1,310	\$4.84	\$6,346	0.7130	\$4,524
2009	1,310	\$4.84	\$6,346	0.6663	\$4,228
2010	1,730	\$4.84	\$8,380	0.6227	\$5,218
2011	1,730	\$4.84	\$8,380	0.5820	\$4,877
2012	2,150	\$4.84	\$10,415	0.5439	\$5,665
2013	2,150	\$4.84	\$10,415	0.5083	\$5,294
2004-2013			\$137,570		\$107,744

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Notes:

- 1) Includes existing pilots, new pilots, existing instructors, and new instructors.
- 2) Instructors register once as pilots and once as instructors.
- 3) $\$4.84 = (\$4.74) \times (1.1177/1.0937)$. (Cost to process an airman certificate) \times (Constant dollars conversion factor based on the GDP (chained) price index).

The total estimated pilot and instructor qualification costs to the government is approximately \$384,000 or (\$316,000 discounted), as shown in Table S.6.

Table S.6. Pilot and Instructor Qualification Costs (2004 -2013)	Undiscounted Cost	Discounted Cost
Table 39. Drafting of General Aviation Inspector's Handbook	\$12,575	\$11,752
Table 40. Drafting of Pilot Examiner's Handbook	\$12,575	\$11,752
Table 41. Update of the ACRA Program	\$70,370	\$65,766
Table 42. Cost of Reviewing and Processing Original Pilot and Flight Instructor Applications (Part 61)	\$151,097	\$119,155
Table 43. Cost of Airmen Registration	\$137,570	\$107,744
Total	\$384,187	\$316,170

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

B.3.3. Maintenance Provisions

The FAA estimates it will take a GS-15 employee 960 hours to develop supporting materials for repairmen certification and inspection requirements in the first year and 40 hours to maintain the materials each of the following nine years. Over 10 years, this cost will be approximately \$88,000 (\$76,000, discounted), as shown in Table 44.

Table 44. Cost to Develop Supporting Materials for Repairmen Certification and Inspection Requirements					
Years	# of employees	Hours	GS-15 Wage	Undiscounted Cost	Total Discounted Costs
2004	1	960	\$66.44	\$63,780	\$59,608
2005	1	40	\$66.44	\$2,657	\$2,321
2006	1	40	\$66.44	\$2,657	\$2,169
2007	1	40	\$66.44	\$2,657	\$2,027
2008	1	40	\$66.44	\$2,657	\$1,895
2009	1	40	\$66.44	\$2,657	\$1,771
2010	1	40	\$66.44	\$2,657	\$1,655
2011	1	40	\$66.44	\$2,657	\$1,547
2012	1	40	\$66.44	\$2,657	\$1,445
2013	1	40	\$66.44	\$2,657	\$1,351
2004-2013				\$87,697	\$75,789
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003					
Notes:					
The GS-15 will write advisory circulars, handbooks, orders, bulletins, and articles.					

The total number of repairman applications equals the number of sport pilots who take the inspection repairman course (from Table 30) plus the number of instructors and sport pilots who take the maintenance repairman course (from Table 31). The FAA estimates it will take a GS-14 fifteen minutes to review and process each repairman application. This cost will be approximately \$336,000 (\$267,000, discounted), over the next ten years, as shown in Table 45.

Table 45. Cost of Reviewing and Processing the Repairmen Applications					
Part 65: 8610-2					
Year	# of Applications	Hours	GS-14 Wage	Undiscounted Cost	Discounted Cost
2004	7,200	0.25	\$56.48	\$101,665	\$95,014
2005	6,800	0.25	\$56.48	\$96,017	\$83,865
2006	968	0.25	\$56.48	\$13,668	\$11,157
2007	968	0.25	\$56.48	\$13,668	\$10,427
2008	1,397	0.25	\$56.48	\$19,719	\$14,059
2009	1,085	0.25	\$56.48	\$15,313	\$10,204
2010	1,253	0.25	\$56.48	\$17,685	\$11,014
2011	1,253	0.25	\$56.48	\$17,685	\$10,293
2012	1,421	0.25	\$56.48	\$20,058	\$10,910
2013	1,421	0.25	\$56.48	\$20,058	\$10,196
2004-2013				\$335,536	\$267,139
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003					

The FAA will update the ACRA program so that applicants for repairman light-sport aircraft can enter the 8610-2 information directly into ACRA. The FAA estimates the cost of gathering, designing and developing the ACRA Sport Pilot paths for the LSA. This cost occurs in 2004, and the FAA estimates it will be \$32,000 (\$30,000 discounted), as shown in Table 46.

Table 46. ACRA - Repairman LSA Inspection, Maintenance								
			Stand-Alone Program		Add functionality to the web based application			
Year	Wage Rate M Level	Wage Rate O Level	Hours - M Level	Hours - O Level	Hours - M Level	Hours - O Level	Undiscounted Costs	Discounted Costs
2004	\$47.36	\$33.84	110	200	300	160	\$31,600	\$29,533
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003								

Estimated total costs that will be incurred by the government because of the maintenance requirements is approximately \$455,000 (\$372,000 discounted), as displayed in Table S.7. This cost includes the cost to develop supporting material for repairmen certification

and inspection requirements, the cost of reviewing and processing the repairmen applications and the cost of updating the ACRA program.

Table S.7. Maintenance Provisions Costs (2004 -2013)	Undiscounted Cost	Discounted Cost
Table 44. Cost to Develop Supporting Materials for Repairmen Certification and Inspection Requirements	\$87,697	\$75,789
Table 45. Cost of Reviewing and Processing the Repairmen Applications	\$335,536	\$267,139
Table 46. ACRA - Repairman LSA Inspection, Maintenance	\$31,600	\$29,533
Total	\$454,833	\$372,461
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003		

B.3.4. Light Sport Program Office

The FAA will establish a light sport program office. The National Program Office (in AFS-600) will have ten full time employees:

- 1 - National Program Manager/Branch Manager, paid at the K band;
- 4 - Operations Aviation Safety Inspectors, paid at the J band;
- 4 - Airworthiness Aviation Safety Inspectors, paid at the I band; and
- 1- Administrative staff, paid at the E band

The Regional Staff Office will require 6 people as follows: 100% first year, 50% second and third year, and 25% every year after that. The six positions are:

- 3 - Operation Aviation Safety Inspectors, paid at the J band; and
- 3 - Airworthiness Aviation Safety Inspectors, paid at the I band

The FAA also factors in the following costs in 2004:

- 4 permanent change of station (PCS) moves, at \$25,000 each
- Travel for policy development, seminars, and industry meetings, totaling \$177,000, made up of:
 - 13 trips for 8 Inspectors, costing \$1,000 per trip (\$104,000);
 - 15 trips for the Manager, costing \$1,000 per trip (\$15,000); and
 - 8 trips for 6 Inspectors, for the Alaska, Hawaii, and Puerto Rico representatives, costing \$1,000 per trip (\$48,000)
- Training for the ASI representatives, totaling \$49,000, made up of:

- Flight training, initial and recurrent, for 7 ASI's, costing \$5,000 each (\$35,000); and
- Repairman training, for 7 ASI's, costing \$2,000 each (\$14,000)
- Other costs, which include printing, administrative support, and additional items (such as computers, office space and supplies), totaling \$50,000

After 2004, some of these costs will continue:

- All travel will be reduced by 50%, so it will cost \$88,500 per year
- All other costs will be reduced by 40%, and so will cost \$30,000 per year

The FAA does not anticipate any PCS and ASI training costs after 2004.

Total costs, as shown in Table 47, sum to \$13.6 million (\$9.8 million discounted).

Table 47. Light Sport Pilot Program Office																			
					AFS-600				Regional Staff Office					Training AST's					
Year	Wage Rate K	Wage Rate J	Wage Rate I	Wage Rate E	Branch Manager	Safety Inspectors	Airworthiness Inspector	Admin. Staff	Safety Inspectors	Airworthiness Inspector	PCS Moves	Travel	Flight Training	Repairman Training	Other Costs	Undiscounted Costs	Discounted Costs		
2004	\$64.06	\$53.62	\$43.94	\$21.59	\$133,245	\$446,092	\$365,562	\$44,901	\$334,569	\$274,172	\$100,000	\$177,000	\$35,000	\$14,000	\$50,000	\$1,974,539	\$1,845,364		
2005	\$64.06	\$53.62	\$43.94	\$21.59	\$133,245	\$446,092	\$365,562	\$44,901	\$167,284	\$137,086	\$0	\$88,500	\$0	\$0	\$30,000	\$1,412,669	\$1,233,880		
2006	\$64.06	\$53.62	\$43.94	\$21.59	\$133,245	\$446,092	\$365,562	\$44,901	\$167,284	\$137,086	\$0	\$88,500	\$0	\$0	\$30,000	\$1,412,669	\$1,153,159		
2007	\$64.06	\$53.62	\$43.94	\$21.59	\$133,245	\$446,092	\$365,562	\$44,901	\$83,642	\$68,543	\$0	\$88,500	\$0	\$0	\$30,000	\$1,260,484	\$961,617		
2008	\$64.06	\$53.62	\$43.94	\$21.59	\$133,245	\$446,092	\$365,562	\$44,901	\$83,642	\$68,543	\$0	\$88,500	\$0	\$0	\$30,000	\$1,260,484	\$898,708		
2009	\$64.06	\$53.62	\$43.94	\$21.59	\$133,245	\$446,092	\$365,562	\$44,901	\$83,642	\$68,543	\$0	\$88,500	\$0	\$0	\$30,000	\$1,260,484	\$839,914		
2010	\$64.06	\$53.62	\$43.94	\$21.59	\$133,245	\$446,092	\$365,562	\$44,901	\$83,642	\$68,543	\$0	\$88,500	\$0	\$0	\$30,000	\$1,260,484	\$784,966		
2011	\$64.06	\$53.62	\$43.94	\$21.59	\$133,245	\$446,092	\$365,562	\$44,901	\$83,642	\$68,543	\$0	\$88,500	\$0	\$0	\$30,000	\$1,260,484	\$733,613		
2012	\$64.06	\$53.62	\$43.94	\$21.59	\$133,245	\$446,092	\$365,562	\$44,901	\$83,642	\$68,543	\$0	\$88,500	\$0	\$0	\$30,000	\$1,260,484	\$685,620		
2013	\$64.06	\$53.62	\$43.94	\$21.59	\$133,245	\$446,092	\$365,562	\$44,901	\$83,642	\$68,543	\$0	\$88,500	\$0	\$0	\$30,000	\$1,260,484	\$640,766		
2004-2013																\$13,623,264	\$9,777,605		
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003																			

B.3.5. Miscellaneous

Training Recordkeeping Costs

The FAA estimated that the cost to keep records to make sure that repairmen, DARs, and DPEs have the proper training will be approximately \$38,000 (\$30,000, discounted), as shown in Table 48.

Table 48. Cost to Keep Records to make sure that repairmen, DARs and DPEs have the proper training						
Year	# of respondents ¹	Keep Each Record	Clerical Hours ²	GS-5 Wage	Undiscounted Cost	Discounted Cost
2004	7,800	0.08	650	\$18.29	\$11,891	\$11,113
2005	6830	0.08	569	\$18.29	\$10,412	\$9,094
2006	998	0.08	83	\$18.29	\$1,521	\$1,242
2007	1048	0.08	87	\$18.29	\$1,598	\$1,219
2008	1437	0.08	120	\$18.29	\$2,190	\$1,561
2009	1125	0.08	94	\$18.29	\$1,714	\$1,142
2010	1293	0.08	108	\$18.29	\$1,970	\$1,227
2011	1293	0.08	108	\$18.29	\$1,970	\$1,147
2012	1461	0.08	122	\$18.29	\$2,226	\$1,211
2013	1461	0.08	122	\$18.29	\$2,226	\$1,132
2004-2013					\$37,719	\$30,088
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						
Notes:						
1) Includes repairmen, DARs, and DPEs.						
2) Assumes 5 minutes per record						

Accident Investigation Costs

The FAA is authorized to investigate accidents of aircraft that are required to have an airworthiness certificate and be registered. The agency may investigate accidents of ultralight vehicles to determine compliance with part 103. When a determination is made that it is not an ultralight vehicle, the NTSB is notified and an investigation is conducted. Ultralights are not required to be registered under part 103. One of the goals of the rule is that two-seat ultralights and unregistered ultralight-like aircraft be registered, which means that accidents involving these

vehicles will have to be investigated and the investigations costs should be included as costs of the rule.

The FAA employed several steps in calculating the accident investigation costs:

- (a) The FAA calculated the total number of persons who are pilots and instructors each year;
- (b) The FAA assumed that each pilot will fly 2,500 miles per year;
- (c) The FAA used an accident rate of 6.56% per 100,000 miles flown, obtained from AOPA in their April 1, 2003 article, 2002 ASF Nall Report shows GA accidents down;

The FAA calculated the cost by looking at three components of all accident investigations – the amounts of time at the accident site as well as the time needed to investigate an accident and to travel to and from the accident. A list of all accidents from 1992 to 2002 was examined. The FAA culled this data base by only examining part 91 accidents, eliminating any accidents where the entry for the amount of time was either ‘0’ or ‘null’, where the same accident was recorded more than once, and eliminating any accidents where there appeared to be a clear variance in the amount of time recorded, such as one accident where the investigation time was 144 hours, while the time at the accident site and the travel time were both one hour. This analysis yielded an average of 17.7 hours investigation time, 6.3 hours at the accident site, and 4.6 hours travel time, for a total of 28.6 hours. Such accidents are typically investigated by a FG-13, so the FAA used a loaded hourly wage of \$47.80. Total costs per investigation are \$1,367 per accident.

Accident Investigation Costs are shown in table 49. These estimates include only the costs to the FAA for the accident investigation. Over the next ten years this will cost \$437,000 (\$292,000, discounted). NTSB costs were not available at this writing.

Table 49. Accident Investigation Costs							
Year	# of existing pilots, existing instructors and new pilots	Total Number of Persons who are pilots and instructors	Miles flown per year	Number of accidents	Cost for accident investigation	Discount rate	Discounted cost for accident investigation
	(a)	(b)	(c)	(d)	(e)		
2004	8,100	8,100	20,250,000	13	\$17,771	0.9346	\$16,609
2005	8,000	16,100	40,250,000	26	\$35,542	0.8734	\$31,042
2006	800	16,900	42,250,000	28	\$38,276	0.8163	\$31,245
2007	800	17,700	44,250,000	29	\$39,643	0.7629	\$30,244
2008	1,200	18,900	47,250,000	31	\$42,377	0.713	\$30,215
2009	1,200	20,100	50,250,000	33	\$45,111	0.6663	\$30,057
2010	1,600	21,700	54,250,000	36	\$49,212	0.6227	\$30,644
2011	1,600	23,300	58,250,000	38	\$51,946	0.582	\$30,233
2012	2,000	25,300	63,250,000	41	\$56,047	0.5439	\$30,484
2013	2,000	27,300	68,250,000	45	\$61,515	0.5083	\$31,268
				320	\$437,440		\$292,041
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003							

Over 10 years, total miscellaneous costs to the government will be approximately \$475,000 (\$322,000, discounted), as shown in Table S.8.

Table S.8. Miscellaneous Costs (2004 -2013)	Undiscounted Cost	Discounted Cost
Table 48. Cost to Keep Records to make sure that repairmen, DARs and DPEs have the proper training	\$37,719	\$30,088
Table 49. Accident Investigation Costs	\$437,440	\$292,041
Total	\$475,159	\$322,129
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003		

Total Government Costs

Over 10 years, total costs to the government will be approximately \$18.9 million (\$13.9 million, discounted), as shown in Table S.9.

Table S.9. Government Costs (2004 -2013)	Undiscounted Cost	Discounted Cost
Aircraft Certification Costs	\$3,965,729	\$3,090,040
Pilot and Instructor Qualification Costs	\$384,187	\$316,170
Maintenance Provisions Costs	\$454,833	\$372,461
Light-Sport Program Office Costs	\$13,623,264	\$9,777,605
Miscellaneous Costs	\$475,159	\$322,129
Total	\$18,903,172	\$13,878,405
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003		

Total Costs

From 2004 to 2013, the total cost of the rule will be approximately \$221.0 million (\$158.4 million, discounted) and out of pocket costs will be \$158.4 million (\$112.8 million, discounted). The total cost of the rule consists of private sector costs and government costs. Private sector costs will be approximately \$202.1 million (\$144.5 million, discounted) and out of pocket costs will be approximately \$139.5 million (\$98.9 million, discounted). Government costs will be approximately \$18.9 million (\$13.9 million, discounted).

Table S.10. Total Costs (2004 -2013)	Undiscounted Cost	Discounted Cost	Out-of-pocket Cost Undiscounted	Out-of-pocket Cost Discounted
Cost of Aircraft Inspection, certification, and Registration	\$65,225,588	\$46,642,019	\$63,203,639	\$45,108,437
Costs for Training, Testing, and Registering Sport Pilots	\$70,490,197	\$51,445,667	\$37,938,298	\$27,624,173
Costs for Training, Testing, and Registering Instructors with A Sport Pilot Rating	\$3,088,700	\$2,310,446	\$1,558,143	\$1,205,164
Ground Instructor Costs	\$1,176,210	\$826,121	\$0	\$0
Maintenance Costs	\$62,118,520	\$43,304,927	\$36,836,558	\$24,915,704
Total Private Sector Costs	\$202,099,215	\$144,529,179	\$139,536,638	\$98,853,479
Aircraft Certification Costs	\$3,965,729	\$3,090,040	\$3,965,729	\$3,090,040
Pilot and Instructor Qualification Costs	\$384,187	\$316,170	\$384,187	\$316,170
Maintenance Provisions Costs	\$454,833	\$372,461	\$454,833	\$372,461
Light-Sport Program Office	\$13,623,264	\$9,777,605	\$13,623,264	\$9,777,605
Miscellaneous Costs	\$475,159	\$322,129	\$475,159	\$322,129
Total Government Costs	\$18,903,172	\$13,878,405	\$18,903,172	\$13,878,405
Total Costs	\$221,002,387	\$158,407,584	\$158,439,810	\$112,731,884
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				

B.4. Individual Costs

The total cost of the rule for an existing pilot who is a trade organization member and takes a repairman class will range from \$4,800 to \$11,500 (from \$4,200 to \$10,400, discounted) over a

ten-year period. To calculate the lower number, we assumed that pilots acquire kit-built aircraft and that they take the \$500 repairmen class. To calculate the higher number, we assumed that pilots acquire factory-built aircraft and that they take the \$3,000 repairmen class. The total cost of the rule assuming they acquired a kit-built aircraft and had it inspected by a certified mechanic will be \$7,000 (\$5,700, discounted) over a ten-year period. In calculating this cost, the FAA assumed that pilots will incur \$275 per year to have their aircraft inspected by certified mechanics.

The total cost of the rule for a new pilot or an existing pilot who is not a trade organization member and takes a repairman class will range from \$9,200 to \$15,900 (from \$8,300 to \$14,600, discounted) over a ten-year period. Once again, the cost depends on whether or not pilots decide to buy kit-built aircraft or factory-built aircraft, when they buy the aircraft, and whether they take the \$3,000 repairmen class or the \$500 repairmen class. Alternatively, the total cost of the rule assuming they acquired a kit-built aircraft and had it inspected by certified mechanics will be \$11,500 (\$9,800, discounted).

The total cost of the rule for an existing instructor who takes a repairman class will range from \$10,700 to \$16,500 (from \$9,500 to \$13,600, discounted) over a ten-year period. The rule allows a sport pilot to take the repairman class; it does not mandate it. Alternatively, the total cost for an existing instructor who has her aircraft inspected by a certified mechanic will be \$6,000 (\$4,400, discounted).

The total cost of the rule for a new instructor who takes a repairman class will range from \$10,653 to \$11,390 (from \$9,956 to \$10,645, discounted) over a ten-year period. Alternatively, the total cost for a new instructor who has her aircraft inspected by a certified mechanic will range from \$6,200 to \$7,000 (from \$5,100 to \$5,800, discounted). See Appendix G for details on these costs.

C. Benefits Analysis

The FAA expects this rule to provide two major benefits. The first is increased safety in the operation of small simple aircraft identified in the rule as light-sport aircraft. Increased safety

will result in a reduction of the number of future accidents that otherwise could occur, with their accompanying fatalities, injuries and property damage.

The second benefit is the expansion of sport and recreational aviation operations of light-sport aircraft. This will be achieved by more closely matching regulatory requirements with actual needs to assure an adequate level of safety. This rulemaking will enable sport and recreational aviation to be more accessible and affordable while providing an environment in which safe, light-sport aircraft can be manufactured, properly maintained and safely operated. The FAA expects that the combination of affordability and safety will provide an opportunity for many more people to enter and reenter into aviation activity.

Summary of Safety Improvements

This rule incorporates a number of requirements intended to increase the safety of operating light-sport aircraft. These requirements will encourage pilot and instructor pilot training, safe aircraft operation and maintenance, aircraft manufacturing and inspection, and light-sport aircraft maintenance training. A summary of these requirements are listed below:

1. All operators of unregistered ultralight-like aircraft must obtain sport pilot or flight instructor (with a sport pilot rating) certificates. Accidents would be reduced as a result of required training for all new pilots operating light-sport aircraft. The FAA believes that training and testing, appropriate to the type of operation conducted would reduce aircraft accidents.
2. All sport pilots will receive training tailored to specific category and class of light-sport aircraft that they would operate. Due to the unique characteristics of each category and class of light-sport aircraft within the same category, this training is necessary to gain the skills necessary to operate those aircraft.
3. This rule will reduce accidents or incidents by limiting the privileges, but will allow a sport pilot to gain the skills necessary to operate in a simple operating environment and

build experience. A sport pilot may even choose to add privileges, as needed, with appropriate training. This building block approach will allow a sport pilot to gain additional skills through additional training (e.g., operations in Class D, C, or B airspace), when the pilot wants to add more privileges.

4. All new manufactured light-sport aircraft will have to meet industry consensus standards. In addition, these aircraft will be inspected by the FAA or a representative of the FAA to determine that they are safe to fly before issuing an airworthiness certificate. These requirements will reduce some of the accidents due to mechanical problems.
5. All light-sport aircraft must be maintained in accordance with this rule. Some additional accidents due to mechanical problems would be reduced because the rule will require that maintenance be done at regular intervals by certificated repairmen or mechanics. These maintenance requirements will ensure that light-sport aircraft are maintained properly.
6. Establishing repairman training standards for light-sport aircraft will ensure that these aircraft are maintained and inspected by individuals who have been properly trained on these unique types of light-sport aircraft.

Quantified Estimate of Safety Benefits

The FAA has performed an analysis of potential safety benefits of this rule. Safety benefits are the number of accidents that will be avoided because of the rule, with their attendant fatalities, injuries and property damage. The agency estimated the total benefit of the rule taken as a whole because it was unable to separately quantify the expected benefits of each provision of this rule.

This analysis estimated accidents prevented from two sets of data. One set of data was U.S. Government data – the NTSB and NASDAC databases that included accidents involving certificated and uncertificated aircraft that would meet the definition of light-sport aircraft. The second set was from three of the FAA recognized ultralight organizations that kept records of accidents of aircraft meeting the definition of light-sport aircraft, but were not FAA certificated.

The NTSB and NASDAC databases were searched for the years 1995 through 2002 for an initial set of data that would conform to the definition of light-sport aircraft, with respect to weighing less than 1,320 pounds. In addition, the FAA performed a search by aircraft make and model after receiving a comment from the U.S. Hang Gliding Association (USHGA) that suggested we would find more accidents that might be prevented by the rule by searching for specific make and model. The search revealed 1,223 accidents, of which, 1,039 came from the NASDAC database and 184 came from performing make and model searches on the NTSB Accident/Incident database query. The NASDAC search was performed by capping the maximum certified weight at 1,320 pounds to avoid including aircraft that would not meet the weight limitations of a light-sport aircraft. The NASDAC and NTSB databases provided information on pilot certification, aircraft certification, level of experience in hours for the pilot in command, make and model of the accident aircraft, injury level of the occupants, damage level of accident aircraft, as well as causal factors for each accident.

The FAA first eliminated the accidents whose highest injury level was either minor or none. Next, the FAA eliminated the accidents from the NTSB query those aircraft with greater than 1,320 pounds weight, that did not give a weight, or had more than 2 occupants. Then the FAA eliminated those accidents that involved a certificated aircraft flown by a certified pilot. In general, the FAA eliminated accidents of aircraft that had n-numbers. Finally, the FAA eliminated the accidents involving aircraft whose speed was in excess of the limit set forth by the rule, 120 knots. The resulting data set consisted of 66 accidents with injury levels of serious or fatal. A summary of these accidents is provided in Table B.1.

Table B.1 Summary of Accidents Involving Light-Sport Type Aircraft								
NTSB Report Number	Date	Acraft Type	Acraft Make	Acraft Model	Acraft Certification	Pilot Certification	Operator Business Code	Number & Severity of Injuries
SEA95LA070	03/13/1995	Airplane	Quicksilver	MXL II	None	None	Personal	2 Fatalities
BFO95LA039	04/02/1995	Airplane	Piper	J3-C65	Normal	None	Personal	1 Serious
NYC95LA110	05/16/1995	Airplane	Buccaneer	II	None	None	Personal	1 Fatality
BFO95LA057	06/06/1995	Ultralight	CGS Aviation	Hawk	None	Private	Personal	1 Fatality
BFO95LA060	06/09/1995	Airplane	Challenger	II	None	Commercial	Instructional	2 Serious
FTW95LA291	06/28/1995	Airplane	Quicksilver	MXLR II		None	Personal	1 Serious
ATL95LA147	07/17/1995	Airplane	Challenger	Unknown	None	None	Personal	1 Fatality
NYC95LA209	07/31/1995	Airplane	Kolb	Firestar II	None	None	Personal	1 Serious
BFO95LA079	08/10/1995	Airplane	Challenger	II	None	Student	Personal	1 Fatality
MIA96LA024	11/13/1995	Airplane	Rans	S-12	None	None	Personal	2 Fatalities
FTW96LA155	03/24/1996	Airplane	Rans	S-12	Experimental	Student	Personal	1 Fatality
SEA96LA128	06/10/1996	Airplane	Antares	MA30		None	Personal	1 fatality
NYC96LA139	07/02/1996	Airplane	Titan	Tornado	None	Student	Personal	1 Fatality
IAD96LA116	07/13/1996	Ultralight	Quicksilver	Sprint	None	None	Unknown	1 Fatality
MIA96LA201	08/03/1996	Airplane	Challenger	II	None	Student	Personal	1 Serious
MIA96LA219	08/29/1996	Airplane	Kolb	Flightstar	Experimental	None	Unkown	2 Serious
CHI96LA325	09/01/1996	Airplane	Titan	Tornado	None	Student	Personal	1 Fatality, 1 Minor
FTW97LA178	04/22/1997	Airplane	Rans	S-12	None	Student	Personal	2 Serious
NYC97LA121	06/06/1997	Ultralight	Kolb	Firestar		None	Personal	1 fatality, 1 serious
MIA97LA192	06/21/1997	Airplane	Kolb	Firestar II		Pri	Personal	1 fatality
FTW97FA274	07/19/1997	Airplane	Rans	S-9	Experimental	Student	Personal	1 Fatality
CHI97FA272	08/26/1997	Airplane	Kellums	Sonera 1	Experimental		Personal	1 fatality
FTW97LA341	09/06/1997	Airplane	Burgess	Skyhopper	Experimental		Personal	1 Serious
SEA97LA204	09/07/1997	Airplane	Piper	J-3	Normal	None	Personal	2 fatalities
MIA98LA018	11/01/1997	Ultralight	Saldaraiga	Buccaneer 2	None	Student	Personal	1 Fatality
ATL98LA018	12/06/1997	Airplane	Challenger	II	Experimental	None	Personal	1 fatality
FTW98LA071	12/21/1997	Ultralight	Quicksilver	GT 500	None	None	Personal	1 Serious
MIA98LA129	04/11/1998	Airplane	Kolb	Firestar		None	Personal	1 Serious
ATL98LA073	05/03/1998	Airplane	Challenger	II		Pri	Personal	1 fatality
MIA98LA160	05/12/1998	Ultralight	M2	Sport 1000	Experimental	None	Personal	2 fatalities
IAD98LA078	07/09/1998	Airplane	Rans	S-12	Experimental	Student	Personal	2 Serious
FTW98LA313	07/16/1998	Airplane	Rans	S-12 Airaile	Experimental	None	Personal	2 Serious
ATL98LA125	09/16/1998	Ultralight	Buckeye	Dream Machine 582	Experimental	Student	Personal	1 Serious, 1 Minor
FTW99FA022	11/08/1998	Ultralight	Challenger	II	None	Private	Personal	2 Fatalities
NYC99FA078	03/20/1999	Airplane	DELEEUEW	Sprint 1000		Private	Unknown	1 fatality, 1 serious
NYC99LA115	05/20/1999	Gyrocraft		Twinstar	None	Private	Personal	1 Serious, 1 Minor
NYC99LA165	07/04/1999	Airplane	Kolb	Mark III	Experimental	None	Personal	2 fatalities
SEA99LA120	07/17/1999	Airplane	Rans	S-10	None	Private	Personal	2 Fatalities
SEA99LA129A	07/24/1999	Ultralight	UNKNOWN				Personal	3 fatalities
IAD99RA063	09/01/1999	Airplane	Cessna	02/07/1901			Unknown	12 fatalities
ATL00LA036	03/07/2000	Ultralight	Unknown	Unknown	None	Private	Personal	2 Fatalities
CHI00LA167	06/18/2000	Airplane	Rans	S-12 Airaile	None	Commercial	Personal	2 Serious
NYC00LA184	07/01/2000	Airplane	Rans	S-12	None	Commercial	Personal	2 Fatalities
CHI00LA206	07/16/2000	Airplane	Kolb	Firestar II	None	None	Personal	1 Fatality
MIA00LA228	07/23/2000	Airplane	Quicksilver	MXL II Sport		None	Personal	1 fatality

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Table B.1 Summary of Accidents Involving Light-Sport Type Aircraft (con't.)								
NTSB Report Number	Date	Acraft Type	Acraft Make	Acraft Model	Acraft Certification	Pilot Certification	Operator Business Code	Number & Severity of Injuries
SEA00LA143	07/23/2000	Airplane	Challenger	II	None	None	Personal	1 Serious
SEA00LA165	08/14/2000	Airplane	LADD	NIEUPORT 11		Pri	Personal	1 Serious
NYC00LA233	08/20/2000	Airplane	Titan	Tornado	None	Commercial	Personal	1 Serious
MIA00LA276	08/21/2000	Airplane	Quicksilver	Unknown	None	None	Personal	2 Serious
NYC01LA022	10/22/2000	Airplane		Weedhopper		None	Personal	1 Serious
NYC01LA0231	11/07/2000	Airplane	Piper	J3-C65			Personal	1 Serious, 1 Minor
MIA01LA026	11/11/2000	Airplane	J and J	TUKAN		None	Personal	1 Fatality
NYC01LA138	06/05/2001	Ultralight	Interplane	Skyboy		None	Instructional	1 Serious
CHI01LA177	06/17/2001	Airplane	TCRAFT	D-DC065		Private	Personal	1 Serious
MIA01LA170	06/23/2001	Airplane	Unknown	Dragonfly B		Pri	Personal	2 fatalities
CHI01LA194	07/02/2001	Airplane	Challenger	II		Pri	Personal	1 fatality
ANC01LA140	09/09/2001	Airplane	Rans	S-7	Experimental	Student	Personal	1 Serious
CHI02LA062	01/12/2002	Airplane	Avid	Flyer	Experimental	None	Personal	1 fatality
SEA02LA098	06/09/2002	Airplane	Quicksilver	MX II	None	None	Personal	1 fatality
MIA02LA110	06/13/2002	Airplane	HARRISON	Pietenpol Air Can	Experimental	None	Personal	1 fatality, 1 serious
SEA02LA162	06/28/2002	Ultralight	Infinity	Powered Parachute		None	Personal	2 Serious
SEA02LA126	07/09/2002	Airplane	Cosmos	Phase II Trike		None	Personal	1 Serious
CHI02LA268	09/03/2002	Airplane	Rans	S-10 Sakota	Experimental	None	Personal	1 Fatality
NYC02LA195	09/24/2002	Airplane	Rans	S-12	Experimental	None	Personal	1 Fatality
CHI03LA013	10/18/2002	Airplane	Rans	S-10 Sakota	None	None	Personal	1 Fatality
DEN03FA030	01/06/2003	Airplane	Rans	S-12XL			Personal	1 fatality
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003								

The FAA selected 19 of these 66 remaining accidents as likely to be prevented by this rule. The appendix provides the specific reasoning for inclusion of accidents (see Appendix A).

In general, if an accident involved a non-certificated aircraft flown by a certified pilot and the accident was caused by mechanical problems, inadequate maintenance, improper design or construction, or lack of annual inspection, then the FAA assumed that the rule may have prevented the accident. This is because the rule will require annual or 100-hour inspections and regular maintenance conducted by certificated airmen, and will require that aircraft be certificated as airworthy.

In general, if an accident involved a certificated aircraft flown by a non-certificated pilot and the accident was caused by a lack of pilot experience, lack of familiarity with the aircraft, lack of recent experience, adverse weather conditions, poorly executed emergency landing, or an inadvertent stall, then the FAA assumed that the rule may have prevented the accident. This is

because the rule will require at least 20 hours of flight training experience (some of this training would teach stall avoidance and recovery techniques) a series of logbook endorsements for increased privileges, and flight reviews.

In general, if the accident involved a non-certificated aircraft flown by a non-certified pilot and the accident was caused by any of the above causal factors then the FAA assumed that the rule may have prevented the accident.

Also, the FAA examined accidents involving gyroplanes over the period between 1995 and 2002. The final rule will create a gyroplane rating for sport pilots and flight instructors with a sport pilot rating. In addition, the final rule will also require all private pilots and recreational pilots who choose to fly with a passenger in a gyroplane with an experimental certificate to receive additional training, and to receive a category and class rating for gyroplanes. A review of the accidents involving gyroplanes on record with the NTSB revealed that there was 1 accident between 1995 and 2002 that might have been avoided by some of the pilot training requirements in this rule.

The final set of avoidable accidents is detailed in Table B.2. The number of fatalities, serious injuries and degree of aircraft damage for each accident is indicated.

Table B.2 Avoidable Accidents Involving Light-Sport Type Aircraft from 1995-2002						
Date	Location	NTSB Report Number	Number of Fatality Injured	Number of Seriously Injured	Aircraft Destroyed	Aircraft Substantially Damaged
03/13/1995	Hildale, UT	SEA95LA070	2		X	
05/16/1995	Milestone Township, NJ	NYC95LA110	1		X	
06/28/1995	Borger, TX	FTW95LA291		1		X
11/13/1995	Plant City, FL	MIA96LA024	2			X
08/29/1996	Bay Saint Louis, MS	MIA96LA219		2		X
12/21/1997	San Antonio, TX	FTW98LA071		1		X
04/11/1998	Dallas, GA	MIA98LA129		1	X	
05/12/1998	Semmes, AL	MIA98LA160	2		X	
05/20/1999	Bloomsburg, PA	NYC99LA115		1		X
03/07/2000	Dalton, GA	ATL00LA036	2		X	
07/16/2000	Gwinn, MI	CHI00LA206	1		X	
07/23/2000	Chiloquin, OR	SEA00LA143		1		X
08/21/2000	Booneville, MS	MIA00LA276		2		X
06/05/2001	Sayre, PA	NYC01LA138		1		X
06/23/2001	Labelle, FL	MIA01LA170	2			X
01/12/2002	Rush City, MN	CHI02LA062	1			X
06/09/2002	Cook, WA	SEA02LA098	1		X	
06/28/2002	Lewistown, MT	SEA02LA162		2		X
07/09/2002	Dear Park, WA	SEA02LA126		1		X
Total For Eight Year Period			14	13	7	12
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						

The averages were calculated over the eight-year period. In addition, the FAA estimated that from 2006 to 2013 the population of sport pilots and sport pilot instructors would grow at 6.82 percent a year⁵⁷. The FAA assumed that the number of fatalities and serious injuries would also grow at 6.82 % a year. The estimated benefits of avoiding the fatalities, serious injuries, substantially damaged aircraft and destroyed aircraft due to the above accidents are \$85.3 million (\$57.7 million, discounted), as shown in Table B.3.

⁵⁷ $6.82\% = (1.050 \times 1.047 \times 1.068 \times 1.063 \times 1.080 \times 1.074 \times 1.086 \times 1.079)^{\frac{1}{8}} - 1$

Table B.3 Summary of Benefits Involving Avoidable Accidents from Light-Sport Type Aircraft That Were Investigated by the NTSB From 1995 - 2002											
Year	Average Number of Fatalities Per Year	Benefits of Avoiding Fatalities	Average Number of Seriously Injured Per Year	Benefits of Avoiding a Serious Injury	Average Number of Substantially Damaged Aircraft Per Year	Benefit of Avoiding a Substantially Damaged Aircraft	Average Number of Destroyed Aircraft Per Year	Benefits of Avoiding a Destroyed Aircraft	Total Benefits Per Year	Discount Factor	Discounted Benefits Per Year
	14 Over the eight year period	\$3,000,000 per Accident	13 Over the eight year period	\$580,700 per Accident	12 Over the eight year period	\$9,041 per Accident	7 Over the eight year period	\$18,083 per Accident			
2004	1.75	\$5,250,000	1.63	\$943,638	1.50	\$13,562	0.88	\$15,823	\$6,223,022	0.9346	\$5,815,909
2005	1.87	\$5,608,238	1.74	\$1,008,027	1.60	\$14,488	0.93	\$16,902	\$6,647,655	0.8734	\$5,806,319
2006	2.00	\$5,990,920	1.85	\$1,076,811	1.71	\$15,476	1.00	\$18,056	\$7,101,262	0.8163	\$5,796,745
2007	2.13	\$6,399,714	1.98	\$1,150,288	1.83	\$16,532	1.07	\$19,288	\$7,585,822	0.7629	\$5,787,187
2008	2.28	\$6,836,404	2.12	\$1,228,778	1.95	\$17,660	1.14	\$20,604	\$8,103,446	0.7130	\$5,777,645
2009	2.43	\$7,302,890	2.26	\$1,312,625	2.09	\$18,865	1.22	\$22,010	\$8,656,390	0.6663	\$5,768,118
2010	2.60	\$7,801,208	2.41	\$1,402,193	2.23	\$20,153	1.30	\$23,511	\$9,247,065	0.6227	\$5,758,608
2011	2.78	\$8,333,530	2.58	\$1,497,873	2.38	\$21,528	1.39	\$25,116	\$9,878,046	0.5820	\$5,749,112
2012	2.97	\$8,902,174	2.76	\$1,600,081	2.54	\$22,997	1.48	\$26,829	\$10,552,081	0.5439	\$5,739,633
2013	3.17	\$9,509,620	2.94	\$1,709,264	2.72	\$24,566	1.58	\$28,660	\$11,272,110	0.5083	\$5,730,169
2004-2013		\$71,934,698		\$12,929,577		\$185,827		\$216,798	\$85,266,899		\$57,729,445

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

The NTSB generally does not always collect accident data or investigate accidents involving ultralight-like aircraft. For this reason, accident data were obtained from additional sources, which include three trade organizations: Aero Sport Connection (ASC), Experimental Aircraft Association (EAA), and the U.S. Ultralight Association (USUA). Accident data from each trade organization, covering the period between 1995 and 2002, is listed in Appendix B and a summary table of all these accidents, Table B.4, is provided below.

Table B.4 Avoidable Accidents Involving Light-Sport Type Aircraft piloted by trade organization members from 1995-2002						
Year	Location	Association File # if Available	Number of Fatality Injured	Number of Seriously Injured	Aircraft Destroyed	Aircraft Substantially Damaged
1995	AZ	ASCn2	1		X	
1995	N/A	N/A	1		X	
1995	N/A	N/A	2		X	
1996	CA	ASC1	1		X	
1996	IN	ASC2	1		X	
1996	CA	ASCn3	1		X	
1996	MN	ASCn4	2		X	
1996	OH	ASCn5	1		X	
1996	AZ	ASCn6	1		X	
1996	N/A	N/A	2		X	
1996	N/A	N/A	2		X	
1997	WA	ASC3	3		X	
1997	NY	ASC4	2		X	
1998	SD	N/A		1		X
1999	FL	ASC5	2		X	
1999	AZ	ASC6	1		X	
1999	ME	ASC7	1			X
1999	IL	N/A		1		X
2000	MO	ASC8	1		X	
2000	MI	ASC9	1		X	
2000	PA	ASC10	2		X	
2000	WA	ASC11	2		X	
2000	CA	ASC12	2		X	
2000	WI	N/A	1			X
2000	MI	N/A	2		X	
2000	VA	N/A		1		X
2001	FL	ASCn2	1		X	
2001	IA	ASC13	2		X	
2001	CA	ASC14	1		X	
2001	CA	N/A	1		X	
2001	VA	N/A		1		X
2001	NC	N/A		2		X
2001	WA	N/A		1		X
2001	Turlock, CA	N/A		2		X
2001	Minnesota	N/A		1		X
2002	AK	N/A	1		X	
2002	IL	N/A		1		X
2002	Lake Havasu, NV	N/A				X
2002	Sowego, VA	N/A		1	X	
2002	Fort Collins, CO	N/A		1		X
N/A	N/A	N/A	1		X	
N/A	N/A	N/A	2		X	
Total For Eight Year Period			44	13	29	13
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						

A review of the information from the trade organizations revealed that there were 42 accidents between 1995 and 2002 that involved light-sport type aircraft. Because trade association data did not consistently provide sufficient information on the accident and on the causal factors for each accident, the FAA was not able to develop a method to screen these accidents and determine whether the rule might have prevented them. Nonetheless, the FAA has decided to include these accidents to determine the maximum potential benefits of the rule. During the 8-year period from 1995 to 2002, there were roughly 6 fatalities per year, 2 serious injuries per year, 4 destroyed aircraft per year, and 2 substantially damaged aircraft per year. Taking into account that the population of pilots and instructors grew at 6.82 percent over an 8-year period, the FAA estimates there would be 75 fatalities, 22 serious injuries, 50 destroyed aircraft and 22 substantially damaged aircraft during the next 10 years. Using the same assumptions above regarding the value of avoiding casualties and property damage, the FAA estimates that the benefits of avoiding these accidents would be \$240.1 million (\$162.6 million, discounted), as shown in Table B.5.

Table B.5 Summary of Benefits Involving Avoidable Accidents from Light-Sport Type Aircraft Piloted by Members of FAA Recognized Ultralight Organizations From 1995 - 2002											
Year	Average Number of Fatalities Per Year	Benefits of Avoiding Fatalities	Average Number of Seriously Injured Per Year	Benefits of Avoiding a Serious Injury	Average Number of Substantially Damaged Aircraft Per Year	Benefit of Avoiding a Substantially Damaged Aircraft	Average Number of Destroyed Aircraft Per Year	Benefits of Avoiding a Destroyed Aircraft	Total Benefits Per Year	Discount Factor	Discounted Benefits Per Year
	44 Over the eight year period	\$3,000,000 per Accident	13 Over the eight year period	\$580,700 per Accident	13 Over the eight year period	\$9,041 per Accident	29 Over the eight year period	\$18,083 per Accident			
2004	5.50	\$16,500,000	1.63	\$943,638	1.63	\$14,692	3.63	\$65,550	\$17,523,880	0.9346	\$16,377,458
2005	5.88	\$17,625,889	1.74	\$1,008,027	1.74	\$15,695	3.87	\$70,023	\$18,719,635	0.8734	\$16,350,454
2006	6.28	\$18,828,605	1.85	\$1,076,811	1.85	\$16,766	4.14	\$74,801	\$19,996,983	0.8163	\$16,323,495
2007	6.70	\$20,113,388	1.98	\$1,150,288	1.98	\$17,910	4.42	\$79,906	\$21,361,491	0.7629	\$16,296,579
2008	7.16	\$21,485,840	2.12	\$1,228,778	2.12	\$19,132	4.72	\$85,358	\$22,819,108	0.7130	\$16,269,709
2009	7.65	\$22,951,941	2.26	\$1,312,625	2.26	\$20,437	5.04	\$91,182	\$24,376,186	0.6663	\$16,242,882
2010	8.17	\$24,518,084	2.41	\$1,402,193	2.41	\$21,832	5.39	\$97,404	\$26,039,513	0.6227	\$16,216,100
2011	8.73	\$26,191,093	2.58	\$1,497,873	2.58	\$23,322	5.75	\$104,051	\$27,816,338	0.5820	\$16,189,362
2012	9.33	\$27,978,261	2.76	\$1,600,081	2.76	\$24,913	6.15	\$111,151	\$29,714,406	0.5439	\$16,162,668
2013	9.96	\$29,887,378	2.94	\$1,709,264	2.94	\$26,613	6.57	\$118,735	\$31,741,990	0.5083	\$16,136,018
2004-2013		\$226,080,478		\$12,929,577		\$201,312		\$898,162	\$240,109,530		\$162,564,725

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Conclusion

Taking all of the above analyses together the FAA estimates that the potential benefits fall within the range of \$85.3 million (the set of preventable NTSB accidents) to \$325.4 million (the set of

preventable NTSB accidents and the preventable association accidents). The discounted benefits range between \$57.7 million and \$220.3 million.

As estimated elsewhere in this analysis, total costs of the rule are estimated to be \$221.0 million (\$158.4, discounted) over the next ten years. Based on these estimates, safety benefits would equal total costs if the rule is 67.9 percent effective, from the top of the range. The FAA believes that there is a high probability that this level of effectiveness can be achieved.

Other Safety Benefits

In addition to the quantifiable potential benefits, there are other benefits of the proposed rule that would help enhance aviation safety for sport pilots. Such benefits include, but are not limited to, the following:

- Certificated pilots would routinely receive notices of FAA safety programs and are eligible to participate in that supplemental training; current operators of unregistered ultralight-like aircraft do not receive these notices.
- Certificated pilots would receive all Notices to Airmen (NOTAMs), informing them of safety-and security-related information which could impact a flight and potentially reduce accidents; current operators of unregistered ultralight-like aircraft do not receive these NOTAM's.
- Certificated pilots are required to receive weather briefings and, therefore, would be better prepared to avoid bad weather; current operators of unregistered ultralight-like aircraft are not required to receive weather briefings.
- Safety directives, similar to airworthiness directives (AD's) and service bulletins, would be issued for certificated special light-sport aircraft and recommended for experimental light-sport aircraft as part of the FAA's safety monitoring system. There are no safety directives currently being issued to operators of unregistered ultralight-like aircraft.
- Certificated light-sport aircraft repairmen would receive FAA's aircraft-specific safety and training information targeted to these repairmen needs. Currently no aircraft repairman receives any safety and training information targeted to unregistered ultralight-like aircraft.

- Certificated repairmen would be trained on how to report faults or failures to the FAA and light-sport aircraft manufacturers in a way similar to what is used for certificated aircraft. This would greatly improve how light-sport aircraft manufacturers correct faults and make a safer product.

Other Unquantified Benefits

The rule is intended as a means of allowing individuals to experience sport and recreational aviation in a manner that is safe, yet affordable. The FAA believes this rule will help revitalize sport and recreational aviation by encouraging a greater number of people and by making the experience of flight in light-sport aircraft more easily attainable.

The FAA believes this rule may open previously unused markets, providing more investment capital and expanding the availability of insurance coverage. Having certification standards for sport pilots, light-sport aircraft, and maintenance programs may open new markets for sport and recreational aviation for two reasons.

First, the standards will confirm the safety of the sport to potential customers and potential pilots. The FAA believes that many individuals will be more likely to participate in sport and recreational aviation if they can rely on the Federal Government to impose safety requirements for sport pilots, flight instructors with sport pilot ratings, and their aircraft.

Second, the standards may reduce the financial risk for investors who may wish to fund a light-sport business venture. The FAA believes that establishing safety standards for sport pilots and aircraft will help remove some of the concerns of potential investors about the risks involved in providing capital to an individual who wishes to operate a flight school using light-sport category aircraft. Therefore, the FAA believes that requiring single and two-seat ultralight-like aircraft and two-seat ultralight vehicles used for training for compensation or hire to be brought under this rule will eliminate the potential barriers to the growth of sport and recreation aviation by confirming the safety of the sport to consumers and investors.

V. ANALYSIS OF ALTERNATIVES

A. Alternative One - Status Quo Alternative

When analyzing alternatives to any proposed regulatory action, the status quo is typically analyzed as one of the other alternatives. The status quo in this case represents a situation in which the FAA would continue to issue training exemptions from part 103 indefinitely. This would perpetuate “rulemaking by exemption.” DOT and FAA policy is to issue exemptions only to cover unique situations, usually for a limited time. The FAA does not intend to issue exemptions to address situations of a general nature. The FAA issued exemptions for flight training in 1995 after initiating this rulemaking project. The FAA issued the exemptions under the assumption that they would soon be superceded by rulemaking. The FAA therefore rejects the status quo as a viable alternative, and has initiated rulemaking.

B. Alternative Two - Strictly Enforce Current Regulations

The second alternative is to strictly enforce the current rules that would apply to sports pilots. The problem with this is that the existing rules on these types of operations and aircraft were developed long before sports pilots became a large and growing part of aviation. The current rules, if strictly enforced, would result in very costly requirements.

There are three categories of costs delineated in Table 50 associated with strictly enforcing current regulations. The first category of certification and inspection type costs total \$29 million (\$21 million discounted) for the alternative. This is actually less than for the proposed rule due to the likelihood of pilots renting aircraft instead of buying them. Strict enforcement of the current rule covering pilot training and testing would result in an estimated \$356 million (\$270 million discounted). In particular, flight training of pilots accounts for \$270 million (\$213 million discounted) of this cost.⁵⁸ These costs are much greater than those of the proposed rule

⁵⁸ The FAA also calculated the Flight Training costs if ultralight-like pilots had to obtain a recreation pilot certificate as an alternative to a sport pilot certificate. The FAA estimates that Flight Training costs in this scenario would equal \$239 million undiscounted or \$184 million discounted.

(\$72 million undiscounted or \$53 million discounted) for training, testing and registering of sports pilots. The third category is maintenance costs. Maintenance costs for the alternative is similar between the rule and the strict enforcement alternative.

From 2004 to 2013, the total cost of this alternative will be approximately \$478 million (\$368 million discounted). The cost of this alternative is clearly more expensive than the final rule, and the requirements to manufacture, operate, and maintain are inappropriate for these simple aircraft, which is why the FAA is issuing this rule. Also enforcing the current rule would not be appropriate for light-sport aircraft. Some of the training required for the alternative may be inappropriate or irrelevant. For example, the controls for weight shift aircraft are the opposite of the controls in a standard aircraft in which the student pilot would receive dual instruction. For more details concerning how the costs of strictly enforcing the current rule see Appendix F.

TABLE 50 SUMMARY OF COSTS OF ALTERNATIVE (in millions \$)

Private Sector (2004 -2013)	Total Cost Undiscounted	Total Cost Discounted	Strict Enforcement of Current Rule Undiscounted	Strict Enforcement of Current Rule Discounted
Cost of Aircraft Inspection, certification, and Registration				
Table 1. Cost of Light-Sport Aircraft Airworthiness Certification Inspections	\$18	\$13	\$26	\$19
Table 2A. Costs of Purchasing Aircraft that Comply with the Consensus Standards	\$45	\$32	\$0	\$0
Table 3. Cost of Manufacturers Applying for a U.S. Identification Number	***	***	\$0	\$0
Table 4. Cost of Obtaining Identification number for: Existing and Kit-Built Light-Sport Aircraft	***	***	***	***
Table 5. Time Cost of Registering Aircraft New and Existing Light-Sport Aircraft	\$1	\$1	\$1	\$1
Table 6. Cost of Returning Form 8050-3	***	***	***	***
Table 7. Cost of Obtaining a Duplicate Certificate of Registration when the Certificate has Been Lost	***	***	***	***
Table 8. Cost to Display Aircraft Marks	\$1	\$1	\$1	\$1
Subtotal	\$65	\$46	\$29	\$21
Costs for Training, Testing, and Registering Sport Pilots				
Table 9A. Ground Training Costs for Pilots not with Associations	\$7	\$5	\$53	\$42
Table 9B. Ground Training Costs for Pilots with Associations	\$3	\$2	\$0	\$0
Table 10. Knowledge Test Costs	\$3	\$3	\$5	\$4
Table 11. Cost of Retesting Instructors Who Fail the Knowledge Test	\$1	\$1	\$1	***
Table 12. Cost to Provide the FAA a Certified Copy of Ultralight Pilot Records	***	***	\$0	\$0
Table 13A. Flight Training Costs of Pilots not with Associations	\$22	\$18	\$270	\$213
Table 13B. Flight Training Costs of Pilots with Associations	\$15	\$10	\$0	\$0
Table 14. Cost of Applying to become a Sport Pilot (Form 8710-1)	\$1	\$1	\$1	\$1
Table 15. Practical Test Costs	\$5	\$4	\$11	\$9
Table 16. Cost of Retesting after Pilots or Instructors Fail the Practical Test	\$1	***	\$1	\$1
Table 17. Flight Review Costs	\$12	\$8	\$13	\$8
Table 18. Cost of BFR Logbook Endorsements	***	***	***	***
Table 19. Recent Flight Experience	\$1	\$1	\$1	\$1
Subtotal	\$71	\$51	\$356	\$279
Costs for Training, Testing, and Registering Instructors with A Sport Pilot Rating				
Ground Training	\$0	\$0	\$10	\$8
Table 20. Knowledge Test Costs	***	***	\$1	\$1
Table 21. Cost of Retesting after Instructors Fail the Knowledge Test	***	***	***	***
Table 22. Cost to Provide the FAA a Certified Copy of Ultralight Pilot Records (61.453 d)	***	***	\$0	\$0
Table 23. Flight Training Costs-New Instructors	\$2	\$1	\$22	\$18
Table 24. Cost of Buying the Training Course from Associations	***	***	***	***
Table 25. Cost of Applying to Become an Instructor	***	***	***	***
Table 26. Practical Test Costs	***	***	\$3	\$3
Table 27. Cost of Retesting after Pilots or Instructors Fail the Practical Test	***	***	***	***
Subtotal	\$3	\$2	\$37	\$31
Maintenance Costs				
Ground Instructor Costs (Table 28)	\$1	\$1	\$0	\$0
Table 29. Cost of Inspections at a Repair Shop	\$16	\$9	\$54	\$36
Table 30. Cost of Inspection Repairmen Obtaining a Repairmen certificate with an Inspection Rating	\$20	\$16	\$0	\$0
Table 31. Cost of Obtaining a Repairmen Certificate with a Maintenance Rating	\$26	\$17	\$0	\$0
Table 32. Cost of Submitting Form 8610-2	***	***	\$0	\$0
Table 33. Cost of Logbook Endorsement	***	***	\$0	\$0
Subtotal	\$62	\$43	\$54	\$36
Total of Private Sector Costs	\$201	\$143	\$476	\$367
Government Costs (2004 -2013)	Total Cost Undiscounted	Total Cost Discounted	Cost Undiscounted	Out-of-pocket Cost Discounted
Aircraft Certification Costs				
Table 34. Cost of Working with Industry to Develop the Consensus Standards	***	***	\$0	\$0
Table 35. Appointing, Supervising, and Renewing a DAR	\$2	\$2	\$0	\$0

Costs for Training, Testing, and Registering Instructors with A Sport Pilot Rating				
Ground Training	\$0	\$0	\$10	\$8
Table 20. Knowledge Test Costs	***	***	\$1	\$1
Table 21. Cost of Retesting after Instructors Fail the Knowledge Test	***	***	***	***
Table 22. Cost to Provide the FAA a Certified Copy of Ultralight Pilot Records (61.453 d)	***	***	\$0	\$0
Table 23. Flight Training Costs-New Instructors	\$2	\$1	\$22	\$18
Table 24. Cost of Buying the Training Course from Associations	***	***	***	***
Table 25. Cost of Applying to Become an Instructor	***	***	***	***
Table 26. Practical Test Costs	***	***	\$3	\$3
Table 27. Cost of Retesting after Pilots or Instructors Fail the Practical Test	***	***	***	***
Subtotal	\$3	\$2	\$37	\$31
Maintenance Costs				
Ground Instructor Costs (Table 28)	\$1	\$1	\$0	\$0
Table 29. Cost of Inspections at a Repair Shop	\$16	\$9	\$54	\$36
Table 30. Cost of Inspection Repairmen Obtaining a Repairmen certificate with an Inspection Rating	\$20	\$16	\$0	\$0
Table 31. Cost of Obtaining a Repairmen Certificate with a Maintenance Rating	\$26	\$17	\$0	\$0
Table 32. Cost of Submitting Form 8610-2	***	***	\$0	\$0
Table 33. Cost of Logbook Endorsement	***	***	\$0	\$0
Subtotal	\$62	\$42	\$54	\$36
Total of Private Sector Costs	\$204	\$145	\$476	\$367
Government Costs (2004 -2013)	Total Cost Undiscounted	Total Cost Discounted	Cost Undiscounted	Out-of-pocket Cost Discounted
Aircraft Certification Costs				
Table 34. Cost of Working with Industry to Develop the Consensus Standards	***	***	\$0	\$0
Table 35. Appointing, Supervising, and Renewing a DAR	\$2	\$2	\$0	\$0
Table 36. Cost of Aircraft Registration	\$1	\$1	\$1	\$1
Table 37. Cost of Assigning a Special Number (Part 47)	***	***	***	***
Table 38. Cost to Process the Certification as to True Copy of Identification Form (Part 47)	***	***	***	***
Subtotal	\$4	\$3	\$1	\$1
Pilot and Instructor Qualification Costs				
Table 39. Drafting of General Aviation Inspector's Handbook	***	***	\$0	\$0
Table 40. Drafting of Pilot Examiner's Handbook	***	***	\$0	\$0
Table 41. Update of the ACRA Program	***	***	\$0	\$0
Table 42. Cost of Reviewing and Processing Original Pilot Applications (Part 61)	***	***	\$0	\$0
Table 43. Cost of Issuing Temporary and Permanent Certificates	***	***	***	***
Table 44. Cost of Airmen Registration	***	***	***	***
Subtotal	\$1	\$1	***	***

Maintenance Provisions Costs				
Table 45. Cost to Develop Supporting Materials for Repairmen Certification and Inspection Requirements	***	***	\$0	\$0
Table 46. Cost of Reviewing and Processing the Repairmen Applications	***	***	\$0	\$0
Table 47. ACRA - Repairman LSA Inspection, Maintenance	***	***	\$0	\$0
Subtotal	***	***	\$0	\$0
Light-Sport Program Office Costs	\$14	\$10	\$0	\$0
Miscellaneous Costs				
Table 49. Cost to Keep Records to make sure that repairmen, DARs and DPEs have the proper training	***	***	\$0	\$0
Table 50. Accident Investigation Costs	***	***	***	***
Subtotal	***	***	***	***
Total of Government Costs	\$19	\$14	\$2	\$1
Total Costs (2004 -2013)	\$241	\$159	\$478	\$368

VI. Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) establishes “as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation.” To achieve that principle, the RFA requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The RFA covers a wide-range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the agency determines that it will, the agency must prepare a regulatory flexibility analysis as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980

RFA provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

Most of the individual sport pilots impacted by this rulemaking are people who are flying as a hobby. The Regulatory Flexibility Act does not apply to them. However, some of the sport pilot instructors are providing instruction as a business endeavor, and in these cases the Regulatory Flexibility Act does apply. Costs imposed on instructors are between \$6,000 and \$7,000 over a ten-year period. This cost does not include any cost for the maintenance repair class. The rule allows a sport pilot with an instructor rating to take this class, the rule does not mandate it. For this reason, the cost of this class is not considered in this regulatory flexibility determination. On an annualized basis, these imposed costs are between \$630 and \$820, which the FAA does not consider as significant costs. Some existing instructors will have to acquire a new light sport aircraft within five years if they plan to continue instructing student sport pilots. A little over a quarter of the new and existing sport pilot instructors would be impacted by this provision of the rule. For these instructors, if they are not able to sell their old light sport aircraft, the ten year imposed cost of this rule could be as high as \$11,700 or \$1,220 annualized (in most cases the cost would be less). For some weekend instructors these costs may be more than what they may wish to incur, and they would stop being instructors. The FAA does not believe this will occur, because the FAA believes that most, possibly all, of these instructors will be able to sell their old light sport aircraft that this rule requires them to replace. By selling their old light sport aircraft, these impacted instructors could reduce the ten-year costs imposed by this provision to about \$6,000, which could reduce their annualized costs to \$630. The FAA does not consider this to be a significant cost. Consequently, the FAA certifies that the rule will not have a significant economic impact on a substantial number of sport pilot instructors.

VII. International Trade Impact Assessment

The Trade Agreement Act of 1979 prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. This effort includes both barriers affecting the export of American goods and services to foreign countries and barriers affecting the import of foreign goods and services into the United States.

In accordance with the above statute, the FAA has assessed the potential effect of the proposal and has determined that it will not present a significant impediment to either U.S. firms doing business abroad or foreign firms doing business in the United States. The rule is expected to stimulate a great deal of growth for the light-sport aircraft aviation industry in the United States and abroad. The belief that no significant trade disadvantage will take place is based on the premise that the number of the requirements contained in the rule (namely, aircraft certification standards) essentially mirrors those that already exist internationally.

VIII. Unfunded Mandates Assessment

The Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995, is intended, among other things, to curb the practice of imposing unfunded Federal mandates on State, local, and tribal governments.

Title II of the Act requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in a \$100 million or more expenditure (adjusted annually for inflation) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a “significant regulatory action.”

Since the compliance cost of the rule does not exceed \$100 million in any of the years, the rule does not contain such a mandate. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

IX. Appendix A – Summary of NTSB Historical Accidents (1995 –2002) for Part 103 (Ultralight Vehicles) and Light-Sport Aircraft Operators (Part 91)

Accidents that might have been avoided by the sport pilot rule

The following paragraphs describe accidents that may have been prevented by the rule. Each accident description is accompanied by a brief description of the accident, the accident cause and an explanation of how the accident might have been avoided had the rule been in place. Where possible, the specific provision of the rule, which could have ameliorated the situation in such a way as to avoid the accident, is indicated.

NTSB Event ID # 20001207x03201

NTSB Report #: SEA95LA070

Local Date: March 13, 1995

Location: Hildale, Utah

This accident involved an unregistered Quicksilver MXL2 airplane operated by an uncertified pilot. The airplane impacted terrain during an uncontrolled descent and was destroyed. There were no apparent mechanical failures or malfunctions. Neither the aircraft nor its occupants were registered with USUA or EAA for flight instruction. The cause of the accident was the pilot's failure to maintain adequate airspeed while banking the airplane which led to an unrecoverable aerodynamic stall in close proximity to the ground. Contributing factors were the pilot's exceeding the airplane's weight and balance limitations, and his lack of total flight experience.

Result of the accident

There were two fatalities and the aircraft was destroyed.

How the Rule Might Have Prevented the Accident

The pilot would have to become certified as a sport pilot under the rule. He would then have received training covered by the following provisions:

§61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

(h) Weight and balance computations.

(j) Stall awareness, spin entry, spins, and spin recovery techniques, if applicable.

If the pilot had had a sport pilot certificate he would have received training that would have helped him to avoid the accident.

NTSB Event ID 20001207X03534

NTSB Report #: NYC95LA110

Local Date: May 16, 1995

Location: Millstone Township, NJ

This accident involved an unregistered two-seat experimental homebuilt airplane Highcraft Buccaneer II operated by a non-certificated pilot. The cause was loss of engine power due to the seizure of the number one cylinder piston and the pilot's failure to maintain adequate airspeed which resulted in a stall.

Result of the Accident

The pilot was fatally injured and the aircraft was destroyed.

How the Rule Might Have Prevented the Accident

The rule would have required the aircraft and pilot become certified. The aircraft would have then been subject to inspection and perhaps the piston problem might have been prevented. Had the pilot been certified as a sport pilot he would have received the following training which would have made it more likely that he would have recovered from the stall:

§61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

(j) Stall awareness, spin entry, spins, and spin recovery techniques, if applicable

NTSB Event ID 20001207X03727

NTSB Report #: FTW95LA291

Local Date: June 28, 1995

Location: Borger, TX

A non-certified pilot of an unregistered two-seat experimental airplane, a Quicksilver MXLR II was unable to become airborne during takeoff.

Result of the Accident

The pilot was seriously injured and the aircraft sustained substantial damage.

How the Rule Might Have Prevented the Accident

The rule would require the pilot have received the following training:

§61.311 What flight proficiency requirements must I meet to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground and flight training from an authorized instructor on the following areas of operation, as appropriate, for airplane single-engine land or sea, glider, gyroplane, airship, balloon, powered parachute land or sea, and weight-shift-control aircraft land or sea privileges:

(d) Takeoffs (or launches), landings, and go-arounds.

NTSB Event ID 20001207X04899

NTSB Report #: MIA96LA024

Local Date: November 13, 1995

Location: Plant City, FL

An unregistered RansS-12, crashed on takeoff from Plant City Airport, while on a 14 CFR Part 91 personal flight. No preimpact failures were noted. The cause of the accident was the failure of the non-certificated pilot to maintain adequate airspeed during takeoff, which resulted in an inadvertent stall and collision with the terrain.

Result of the Accident

The pilot and passenger received fatal injuries and the airplane was substantially damaged.

How the rule might have prevented

The rule would require that the pilot receive training which would have included:

§61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

(k) Stall awareness, spin entry, spins, and spin recovery techniques, if applicable.

If the pilot had a sport pilot certificate he would have received training that would have helped him avoid the accident.

NTSB Event ID 20001208X06587

NTSB Report #: MIA96LA219

Local Date: August 29, 1996

Location: Bay Saint Louis MS

A nonregistered Flight Star 2S1 airplane piloted by a noncertificated pilot, and operated as a 14 CFR part 91 demonstration flight, crashed on initial takeoff climb. The cause of the accident was the failure of the pilot to maintain adequate airspeed while maneuvering after takeoff, which resulted in an inadvertent stall and subsequent in-flight collision with terrain.

Result of the Accident

The pilot and the passenger were seriously injured and the aircraft was substantially damaged.

How the rule might have prevented the accident

The pilot would have been required under the rule to receive training as follows:

§61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

- (l) Stall awareness, spin entry, spins, and spin recovery techniques, if applicable.

NTSB Event ID # 20001208X09309

NTSB Report #: FTW98LA071

Local Date: December 21, 1997

Location: San Antonio, TX

An unregistered amateur-built Quicksilver GT-500 airplane impacted the ground during an uncontrolled descent following the failure of the left leading edge wing strut fitting. The two-place kit-built aircraft was being operated as an ultralight under an exemption to part 103.

Result of the Accident

The pilot sustained serious injuries, the student passenger sustained minor injuries and the airplane sustained substantial damage.

How the Rule Might have Prevented

Under the rule a special light-sport aircraft that is used for training will have to be inspected by at least a repairman with a maintenance rating. Currently, there are no requirements that the person doing the inspection have training.

NTSB Event ID # 20001211X09915

NTSB Report #: MIA98LA129

Local Date: April 11, 1998

Location: Dallas, GA

An unregistered, homebuilt, Kolb Firestar airplane operated by a pilot who did not hold an FAA certificate collided with trees during approach to land because it encountered wind gusts. The

pilot had 1013 hours. The accident was due to the pilot's failure to maintain adequate airspeed for the existing wind conditions.

Result of the Accident

The aircraft was destroyed and the pilot received serious injuries.

How the Rule might have prevented the accident

The pilot would be required to become a sport pilot under the rule and have received training which would have included:

§61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

(e) Recognition of critical weather situations from the ground and in flight, wind shear avoidance, and the procurement and use of aeronautical weather reports and forecasts.

NTSB Event ID # 20001211X10155

NTSB Report #: MIA98LA160

Local Date: May 12, 1998

Location: Semmes, AL

An unregistered two-place ultralight operated without an FAA waiver by an uncertified pilot took off, flew into turbulence and abruptly reversed course. The ultralight impacted a 6 to 8 foot embankment within a dirt pit about 100 yards short of the grass strip. The accident was caused

by the pilot's failure to maintain control of the ultralight after an encounter with turbulence during initial climb out.

Result of the Accident

The pilot and passenger were fatally injured and the aircraft was destroyed.

How the Rule Might Have Prevented

The rule would have required the pilot to receive training (as a sport pilot). The sport pilot training would have included:

§61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

(e) Recognition of critical weather situations from the ground and in flight, wind shear avoidance, and the procurement and use of aeronautical weather reports and forecasts.

NTSB Event ID # 20001212X18868
NTSB Report #: NYC99LA115
Local Date: May 20, 1999
Location: Bloomsburg, PA

This accident involved an uncertificated gyroplane operated by a private pilot who did not have a rotorcraft rating. The pilot's failure to maintain sufficient takeoff rpm was the cause of the accident.

Result of the accident

The aircraft was substantially damaged, the pilot received serious injuries and the passenger received minor injuries.

How the Rule Might Have Prevented the Accident

The pilot would have been required to receive additional training to obtain a gyroplane rating under the rule in order to carry a passenger.

NTSB Event ID 20001212X20586
NTSB Report #: ATL00LA036
Local Date: March 7, 2000
Location: Dalton, GA

A private pilot with 80 hours experience was operating his unregistered experimental two-seat Trike when it hit a tree and fell to the ground during approach to landing. The airplane was flying in loose formation with two other airplanes. During final approach to landing the airplane's left wing struck an oak tree and the airplane descended and collided with the ground. The pilot was not operating under an exemption. The accident was caused by the pilot's failure to maintain appropriate clearance with objects during final approach to landing. A factor was the tree.

Result of the Accident

The pilot and passenger sustained fatal injuries.

How the Rule Might Have Prevented

The rule would have required that the private pilot have a proficiency check and or get training in the Trike.

NTSB Event ID 20001212X21397

NTSB Report #: CHI00LA206

Local Date: July 16, 2000

Location: Gwinn, MI

An unregistered Mead Kolb Firestar II, operated by an uncertificated pilot was destroyed on impact with trees and terrain following takeoff. The accident was caused by the pilot not obtaining and maintaining altitude/clearance. Factors were the tree and the high density altitude.

Result of the accident

The pilot sustained fatal injuries.

How the Rule Might Have Prevented

The pilot would be required under the rule and to receive training in the following:

§61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

(f) Safe and efficient operation of aircraft, including collision avoidance, and recognition and avoidance of wake turbulence.

(g) Effects of density altitude on takeoff and climb performance.

NTSB Event ID 20001212X21616
NTSB Report #: SEA00LA143
Local Date: July 23, 2000
Location: Chiloquin, OR

This accident involved an unregistered Challenger II that was operated by a pilot who held an expired student pilot certificate. No student endorsements were identified. The accident was caused by loss of engine power for undetermined reasons and the pilot's failure to maintain aircraft control. Ten minutes after departure the engine failed and lost power over heavy timber terrain. The aircraft descended about 800 feet before the pilot was able to pull the nose up just prior to colliding with the ground.

Result of the Accident

The pilot suffered a serious injury and the aircraft was substantially damaged.

How would the rule have prevented

Under the rule this type of vehicle would have to be certificated, inspected and maintained. These processes might have caught the problem with the engine and prevented the accident.

NTSB Event ID 20001212X21842
NTSB Report #: MIA00LA276
Local Date: August 21, 2000
Location: Booneville, MS

This accident involved an unregistered homebuilt Christian Quicksilver piloted by an uncertified pilot. According to the pilot "soon after takeoff the ultralight stalled on the wing causing the

ultralight to go into a left turn sending it towards a small tree about 15 – 18 feet. The ultralight struck the top of the tree and forced us to the ground.”

The pilot thought he was operating an ultralight. Under the rule, the pilot would be required to receive pilot training because this vehicle will be a light-sport vehicle.

Result of the Accident

The pilot and passenger sustained serious injuries.

How the Rule Might Have Prevented the Accident

The pilot might have become a sport pilot under the rule and have been trained in areas including the following:

§61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

- (j) Stall awareness, spin entry, spins, and spin recovery techniques, if applicable.

§61.311 What flight proficiency requirements must I meet to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground and flight training from an authorized instructor on the following areas of operation, as appropriate, for airplane single-engine land or sea, glider, gyroplane, airship, balloon, powered parachute land or sea, and weight-shift-control aircraft land or sea privileges:

- (d) Takeoffs (or launches), landings, and go-arounds.

NTSB Event ID 20010613x01166

NTSB Report #: NYC01LA138

Local Date: June 5, 2001

Location: Sayre, PA

An unregistered two-seat ultralight piloted by a non-certificated pilot was substantially damaged during takeoff. During the initial climb out after takeoff, the ultralight was seen rolling from side to side and it then rolled inverted and impacted the runway. The pilot failed to maintain optimal climbing speed.

Result of the Accident

The pilot was seriously injured and the vehicle was significantly damaged.

How the Rule Might Have Prevented the Accident

The pilot would have been required to receive sport pilot training under the rule and the training would have included the following:

61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

- (g) Effects of density altitude on takeoff and climb performance.

NTSB Event ID: 20010628X01278

NTSB Report #: MIA01LA170

Local Date: June 23, 2001

Location: Labelle, FL

A private pilot operating an unregistered two-seat DragonFly B, crashed while turning base to final. The flight returned after being airborne about 10 minutes and appeared to be on approach to land. The airplane was observed to be in a right bank, and apparently stalled and went into a spin from which it did not recover. The plane hit the ground nose first.

Result of the Accident

The pilot and passenger were fatally injured and the airplane was substantially damaged.

How would the Rule have Prevented the Accident

The rule will require a private pilot to obtain a category and class rating when carrying a passenger. The aircraft in question was a tail dragger. Under the rule the holder of a recreational pilot certificate or higher will have to obtain a category and class rating when operating an aircraft with an experimental certificate or provisional type-certificate in a category and class different from his or her current rating. This additional endorsement might have required that the pilot get training which could have helped avoid the accident.

NTSB Event ID # 20020118X00088

NTSB Report #: CHI2LA062

Local Date: January 12, 2002

Location: Rush City, MN

An amateur built experimental Wolter Avid Flyer, piloted by an uncertified pilot departed controlled flight from about 150 feet agl and impacted the terrain. The pilot had been practicing taxiing the airplane and was taxiing when the wind caught the left wing of the airplane and it

lifted off the runway. The airplane turned sharply to the right and headed to the southeast. The airplane had difficulty climbing, but it cleared the trees. Then it turned into the wind and climbed to approximately 125 – 150 feet agl hovered briefing and turned downwind. The airplane stalled and pan caked into the ground. The pilot did not hold a pilot's certificate or student pilot certificate, but had applied for a third class medical and student pilot certificate, but was denied. The student had been receiving instruction prior to applying for the medical certificate but discontinued after being denied the medical certificate.

Result of the Accident

The pilot was fatally injured and the aircraft sustained substantial damage.

How the Rule Might have Prevented the Accident

Had the pilot been training for a sport pilot certificate he would not have had to have a third class medical. Therefore he would have been less likely to have given up instruction as he did when he did not obtain the third class medical. The rule would require that the pilot receive the following training:

61.311 What flight proficiency requirements must I meet to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground and flight training from an authorized instructor on the following areas of operation, as appropriate, for airplane single-engine land or sea, glider, gyroplane, airship, balloon, powered parachute land or sea, and weight-shift-control aircraft land or sea privileges:

- (j) Stalls (not applicable to lighter-than-air aircraft, gyroplanes, and powered parachutes).
-

NTSB Event ID: 20020614X00892

NTSB Report #: SEA02LA098

Local Date: June 9, 2002

Location: Cook, WA

An unregistered and uncertificated two-seat Quicksilver MX II airplane was being flown by a non-certificated pilot and collided with a rock embankment. The aircraft was flying as part of a group of small aircraft. One member of the group reported that the group had encountered high winds several miles prior to the crash site. There was no evidence of a preexisting mechanical malfunction or failure. No cause of the accident was given with the accident report.

Result of the Accident

The airplane was substantially damaged and the pilot was fatally injured.

How the Rule Might Have Prevented the Accident

The rule would have required the pilot to receive training as follows:

61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

(e) Recognition of critical weather situations from the ground and in flight, wind shear avoidance, and the procurement and use of aeronautical weather reports and forecasts.

NTSB Event ID: 20020904X01518

NTSB Report #: SEA02LA162

Local Date: June 28, 2002

Location: Lewistown, MT

An unregistered Infinity two-place powered parachute was damaged during a precautionary off-airport landing. The pilot was attempting an off-airport landing in an effort to avoid approaching thunderstorms and associated high wind conditions. On the fourth landing attempt the powered parachute encountered a strong crosswind that blew them into the ground. The accident cause was inadequate preflight planning and inadvertent flight into adverse weather conditions. A high wind condition was a factor in the accident.

The Result of the Accident

The pilot and passenger sustained serious injuries and the vehicle was substantially damaged and received training.

How the Rule Might have Prevented the Accident

Under the rule, the pilot would have been required to receive the following training;

§61.309 What aeronautical knowledge must I have to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground training from an authorized instructor or complete a home-study course on the following aeronautical knowledge areas:

(e) Recognition of critical weather situations from the ground and in flight, wind shear avoidance, and the procurement and use of aeronautical weather reports and forecasts.

(l) Preflight actions that include—

(1) How to get information on runway lengths at airports of intended use, data on takeoff and landing distances, weather reports and forecasts, and fuel requirements;
and

§61.311 What flight proficiency requirements must I meet to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground and flight training from an authorized instructor on the following areas of operation, as appropriate, for airplane single-engine land or sea, glider, gyroplane, airship, balloon, powered parachute land or sea, and weight-shift-control aircraft land or sea privileges:

- (a) Preflight preparation.
- (b) Preflight procedures.

NTSB Event ID # 2000207
NTSB Report #: SEA02LA126
Local Date: July 9, 2002
Location: Deer Park, WA

A two-seat unregistered experimental Cosmos Phase II Trike piloted by the non-certified owner collided with terrain soon after takeoff. The aircraft reached an altitude about 200 feet above ground level and began to descent.

Result of the Accident

The pilot sustained serious injuries and the aircraft was substantially damaged.

How the Rule Might have Prevented the Accident

Under the rule, the pilot would have been required to receive the following training:

§61.311 What flight proficiency requirements must I meet to apply for a sport pilot certificate?

Except as specified in §61.329, to apply for a sport pilot certificate you must receive and log ground and flight training from an authorized instructor on the following areas of operation, as appropriate, for airplane single-engine land or sea, glider, gyroplane, airship, balloon, powered parachute land or sea, and weight-shift-control aircraft land or sea privileges:

- (c) Takeoffs (or launches), landings, and go-arounds.
-

X. Appendix B – Summary of Historical Fatal Accidents (1995-2001) as Compiled by Three Part 103 (Ultralight Vehicle) Organizations (ASC, EAA, USUA), as per Exemption Nos. 6080, 3784, 4274, as Amended

Table B.1 Avoidable Accidents Involving Light-Sport Type Aircraft piloted by USUA members from 1995-2002								
Year	Location	Association File # if Available	Number of Fatality Injured	Number of Seriously Injured	Level of Aircraft Damage	Acraft Certification	Pilot Certification	Cause
1995	N/A	N/A	1		Destroyed	N/A	UL Instructor	Loss of Control
1995	N/A	N/A	2		Destroyed	N/A	UL Instructor	Engine Component Failure
1996	N/A	N/A	2		Destroyed	N/A	UL Instructor	Wing Fabric Failure
1996	N/A	N/A	2		Destroyed	N/A	UL Instructor	Wing Wire Failure
2001	CA	N/A	1		Destroyed	N/A	USUA Pilot	Low altitude stall/spin
2001	Turlock, CA	N/A		2	Substantial	N/A	BF1	Hit powerline then truck on highway due to engine seizure.
2001	Minnesota	N/A		1	Minor	N/A	USUA Student Pilot	Trike ran over pilot while on the ground, pilot caught under trike, dragged into trees, prop cut off leg.
2002	AK	N/A	1		Destroyed	N/A	USUA Pilot	Failure to properly preflight, loss of flight control due to ice on wings.
2002	Sowego, VA	N/A		1	Destroyed	N/A	USUA Pilot	Crashed on take off. Loss of flight controls due to inadequate maintenance an preflight.
2002	Fort Collins, CO	N/A		1	Substantial	N/A	USUA Student Pilot	Crashed on takeoff due to pilot error in not maintaining adequate flight speed
N/A	N/A	N/A	1		Destroyed	N/A	UL Instructor	Lost control when transitioning from three axis aircraft to weight shift control
N/A	N/A	N/A	2		Destroyed	N/A	UL Instructor	Probable bridle entangled propeller

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Table B.2 Avoidable Accidents Involving Light-Sport Type Aircraft piloted by ASC members from 1995-2002								
Year	Location	Association File # if Available	Number of Fatality Injured	Number of Seriously Injured	Level of Aircraft Damage	Acraft Certification	Pilot Certification	Cause
1995	AZ	ASCn2	1		Destroyed	N/A	None	Metal Failure
1996	CA	ASC1	1		Destroyed	N/A	BF1	Control Blockage
1996	IN	ASC2	1		Destroyed	N/A	BF1	Metal Failure
1996	CA	ASCn3	1		Destroyed	N/A	None	Pilot Error
1996	MN	ASCn4	2		Destroyed	N/A	None	Stall Spin
1996	OH	ASCn5	1		Destroyed	N/A	None	Stall Spin
1996	AZ	ASCn6	1		Destroyed	N/A	None	Pilot Error
1997	WA	ASC3	3		Destroyed	N/A	BF1	Midair
1997	NY	ASC4	2		Destroyed	N/A	BF1	Spar Crack
1999	FL	ASC5	2		Destroyed	N/A	BF1	Fouled Lines
1999	AZ	ASC6	1		Destroyed	N/A	BF1	Missing Bolt PE
1999	ME	ASC7	1		Substantial	N/A	BF1	Engine Failure
2000	MO	ASC8	1		Destroyed	N/A	BF1	Student Froze - PE
2000	MI	ASC9	1		Destroyed	N/A	BF1	Student Froze - PE
2000	PA	ASC10	2		Destroyed	N/A	BF1	Stall Spin
2000	WA	ASC11	2		Destroyed	N/A	BF1	Aerobatics - PE
2000	CA	ASC12	2		Destroyed	N/A	BF1	Aerobatics - PE
2001	FL	ASCn2	1		Destroyed	N/A	None	Aerobatics - PE
2001	IA	ASC13	2		Destroyed	N/A	BF1	Weather
2001	CA	ASC14	1		Destroyed	N/A	BF1	Fog Disorientation

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Table B.3 Avoidable Accidents Involving Light-Sport Type Aircraft piloted by EAA members from 1995-2002								
Year	Location	Association File # if Available	Number of Fatality Injured	Number of Seriously Injured	Level of Aircraft Damage	Acraft Certification	Pilot Certification	Cause
1998	SD	N/A		1	Substantial	N/A	EAA Pilot	Flew through rain shower for 10 or 15 minutes, noticed aircraft required progressively more nose up trim and felt heavy, on approach to landing area initiated shallow turn to right, turn ket getting steeper, was unable to raise wing despite full opposite.
1999	IL	N/A		1	Substantial	N/A	EAA Pilot	Pilot did not notice wind change, made a downwind landing. Chete went off to side and hooded on to another pilot's machine, rolling his machine over. The other pilot sufferd bruised ribs. He also was flying a powered parachute.
2000	WI	N/A	1		Substantial	N/A	UL Instructor	Stall Spin
2000	MI	N/A	2		Destroyed	N/A	UL Instructor	Aerobatics - PE
2000	VA	N/A		1	Substantial	N/A	EAA Pilot	Student pilot misjudged landing approach and hit power lines. Canopy remained inflated a hard landing was made. Student pilot suffered a broken rib. Damage to the machine estimated at \$1,000
2001	VA	N/A		1	Substantial	N/A	EAA Pilot	Pilot had broken ankle. Landing accident, at 20 feet AGL, caught in rotor causing chute to oscillate first to far left, then to extreme right. Cart followed pendulum motion in arc, attempting to re-center, but lacked sufficient altitude to complete arc.
2001	NC	N/A		2	Substantial	N/A	EAA Pilot	On departure climb out engine suddenly stopped low to the ground resulting in a stall trainer impacted the ground prior to recovery from stall.
2001	WA	N/A		1	Substantial	N/A	EAA Pilot	Incomplete assembly of elevator control system.
2002	IL	N/A		1	Substantial	N/A	EAA Pilot	Flying at approximately 20 feet AGL encountered prop wash/vortices from another parachute ahead. Downdraft unable to overcome at full power impacted a small ridge made a hard high bounce cocoupled chute collapse dropped right gear first into field.

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

X. Appendix C – Summary of Cost Estimates for Aircraft Ownership

The FAA compiled several tables to reflect the costs of aircraft ownership with information from the manufacturers' web sites. Details pertaining to the aircraft's weight and V_{ne} , which were unavailable on the manufacturers' web sites, were obtained from the January, 2002 edition of Ultralight Flying Magazine. Certain makes and models were excluded if the manufacturer did not give adequate information regarding their prices, maximum takeoff weights or V_{ne} 's, as outlined by this rule. As stated in the rule the maximum takeoff weight for a light-sport aircraft is 1320 lbs. and the maximum continuous power V_h cannot exceed 120 knots, approximately 137 mph. In addition, the FAA did not add any of the options to the agency's estimated cost of a light-sport aircraft, other than engines, available on these aircraft because the FAA does not require them and did not feel they were necessary when calculating the minimum cost to purchase a light-sport aircraft. It was also assumed that no powered parachutes or weight-shift control aircraft would exceed 120 knots or weigh more than 1320 lbs., therefore, most of the manufacturers that gave pricing information on their websites were included in the tables. The gross takeoff weight is displayed in the tables except for the powered parachute category where empty weight was used. The FAA feels that their cost estimates are an accurate reflection of what a typical light-sport aircraft should cost because our unit numbers are in line with those given by a commenter, with the aforementioned exclusions being taken into consideration.

Table C.1 Single Place Powered Parachutes								
Manufacturer	Model	Engine	Place	Fuel Cap.	Weight (lbs)	V _(ne) (in mph)	Kit	Cost
Summit	Summit SS	45 HP	Single	5 gal.	233	N/A	Y	\$8,295
		Rotax 447	Single	5 gal.	252	N/A	Y	\$8,495
		Rotax 503	Single	5 gal.	265	N/A	Y	\$9,395
Blue Heron	Spirit 103	Rotax 447	Single	5 gal.	218	N/A	Y	\$7,995
		Rotax 503	Single	5 gal.	225	N/A	Y	\$11,225
	Express	Rotax 503	Both	5/10 gal.	245	N/A	Y	\$12,750
Buckeye	Brat	Rotax 503	Single	N/A	N/A	N/A	N/A	\$12,995
Six Chuter	Prowler SE	Rotax 503	Single	10 gal.	282	N/A	Y	\$13,775
	Prowler DE	Rotax 582	Single	10 gal.	282	N/A	Y	\$15,250
	Prowler XL	Rotax 582	Single	10 gal.	282	N/A	Y	\$16,050
	Rebel	Rotax 503	Single	5 gal.	250	N/A	Y	\$12,995
Viking Aircraft	Viking	Rotax 503	Single	10 gal.	445	N/A	N	\$10,895
Eagles-Wing	Scout	Zenoah G50	Single	5 gal.	495	N/A	N	\$8,950
Average Cost								\$11,467
Sources: www.summitppc.com, www.infinitypowerchutes.com, www.blueheronppc.com, www.buckeyeaviation.com, www.sixchuter.com, www.vikingii.com, www.eagles-wing.com, November 2002, Ultralight Flying Magazine, January, 2002								

Table C.2 Two Place Powered Parachutes								
Manufacturer	Model	Engine	Place	Fuel Cap.	Weight (lbs)	V _(ne) (in mph)	Kit	Cost
Summit	Summit 2	Rotax 503	Two	10 gal.	300	N/A	Y	\$12,300
		Rotax 582	Two	10 gal.	310	N/A	Y	\$13,495
		Hirth 2706	Two	10 gal.	290	N/A	Y	\$13,795
		HKS700E	Two	10 gal.	338	N/A	Y	\$17,795
		Rotax 912	Two	10 gal.	365	N/A	Y	\$21,095
Infinity	Standard	Rotax 582	Two	N/A	N/A	N/A	N	\$14,000
Blue Heron	Marathon	Rotax 503	Two	10 gal.	285	N/A	Y	\$14,795
	All American	2Si 690 L70	Two	10 gal.	285	N/A	Y	\$14,795
	SC-912	Rotax 912	Two	10 gal.	345	N/A	Y	\$21,795
	Express	Rotax 503	Both	5/10 gal.	245	N/A	Y	\$12,750
Buckeye	Hornet	N/A	Two	N/A	N/A	N/A	N	\$15,995
	Breeze	N/A	Two	N/A	N/A	N/A	N	\$15,795
Six Chuter	Spirit SE	Rotax 503	Two	10 gal.	282	N/A	Y	\$13,775
	Spirit DE	Rotax 582	Two	10 gal.	282	N/A	Y	\$15,250
	Spirit XL	Rotax 582	Two	10 gal.	282	N/A	Y	\$16,050
Kolb Aircraft Co.	Flyer	Rotax 582	Two	10 gal.	290	N/A	N	\$14,000
Viking Aircraft	Viking	Rotax 503	Two	10 gal.	445	N/A	N	\$11,895
Condor	S-Sport	Rotax 582	Two	10 gal.	325	N/A	N	\$11,895
Average Cost								\$15,071
Sources: www.summitppc.com, www.infinitypowerchutes.com, www.blueheronppc.com, www.buckeyeaviation.com, www.sixchuter.com, tnkolbaircraft.com, www.condorppc.com, www.vikingii.com, November, 2002 Ultralight Flying Magazine, January, 2002								

Table C.3 Single Place Weight Shift Control								
Manufacturer	Model	Engine	Place	Fuel Cap.	Weight (lbs)	V _(ne) (in mph)	Kit	Cost
Aquilair USA	Kid	Rotax 503	Single	N/A	716	93	N	\$10,998
Northwing	Maverick	Rotax 447	Single	5 gal.	553	70	N	\$10,400
		Hirth 2702	Single	5 gal.	553	70	N	\$10,500
		Kawasaki 340	Single	5 gal.	553	70	N	\$8,950
		ATF w/ Zen & Illusion Zenoah G25B-1	Single	3 gal.	470	40	N	\$7,990
Average Cost								\$9,768
Sources: www.aquilairusa.com, www.gibbogear.com and www.northwing.com, November 2002, Ultralight Flying Magazine, January, 2002								

Table C.4 Two Place Weight Shift Control								
Manufacturer	Model	Engine	Place	Fuel Cap.	Weight (lbs)	V _(ne) (in mph)	Kit	Cost
Aquilair USA	Swing	Rotax 447	Two	30 litres	892	94	N	\$12,049
		Rotax 503	Two	30 litres	892	94	N	\$13,025
		Rotax 503 S	Two	30 litres	892	94	N	\$15,266
		Rotax 582 S	Two	50 litres	892	94	N	\$17,101
		Rotax 582 SC	Two	50 litres	892	94	N	\$18,768
Watertrikes	Kalypso	Rotax 503	Two	N/A	N/A	N/A	N	\$20,995
Gibbogear	BB 340	Kawasaki 340	Two	10 gal.	900	75	N	\$7,000
	BB 503	Rotax 503	Two	10 gal.	900	65	N	\$8,800
	BB 447	Rotax 447	Two	10 gal.	950	60	N	\$8,100
Northwing	Apache w/ Mustang 2	Rotax 503 B	Two	8.5 gal.	900	60	N	\$13,490
		Rotax 503 E	Two	8.5 gal.	900	60	N	\$15,190
		Rotax 582 C	Two	12 gal.	950	70	N	\$17,100
		Rotax 582 E	Two	12 gal.	950	70	N	\$18,000
	Apache w/ Contour	Rotax 582 C	Two	12 gal.	950	70	N	\$17,400
Quantum	Basic	Rotax 503	Two	10 gal.	N/A	N/A	N/A	\$13,995
	Quantum 912 Supersport	Rotax 912	Two	30 litres	900	90	N/A	\$29,310
	Quantum HKS Supersport	HKS 700E	Two	13 gal.	900	90	N/A	\$26,750
	Quantum 582 Supersport	Rotax 582 C	Two	49 litres	900	90	N/A	\$20,824
	Quantum 582 Sport	Rotax 582 C	Two	49 litres	900	90	N/A	\$19,984
	Quantum 503 Supersport	Rotax 503 C	Two	49 litres	900	90	N/A	\$16,995
Rainbow Aircraft	Quantum 503 Sport	Rotax 503 C	Two	49 litres	900	90	N/A	\$16,495
	Aerotrike Safari	Rotax 503	Two	14 gal	990	90	Y	\$13,850
	Aerotrike Cobra	Rotax 503	Two	14 gal	990	90	Y	\$16,995
Average Cost								\$16,412
Sources: www.aquilairusa.com, www.watertrikes.com, www.gibbogear.com, www.northwing.com and www.pegasus-usa.com, www.aerotrike.co.za, November 2002								
Ultralight Flying Magazine, January, 2002								

Table C.5 Single Place Airplanes								
Manufacturer	Model	Engine	Place	Fuel Cap.	Weight (lbs)	V _(ne) (in mph)	Kit	Cost
Titan Aircraft	Tornado I	Rotax 503	Single	10 gal	750	120	Y	\$13,493
Quicksilver	GT 400	Rotax 503	Single	5 gal	570	74	Y	\$14,995
	GT 400, Special Ed.	Rotax 447	Single	5 gal	570	74	Y	\$12,995
	MX Sprint	Rotax 447	Single	5 gal	525	65	Y	\$8,995
	MX Sport	Rotax 447	Single	5 gal	525	74	Y	\$9,995
CGS Aviation	Hawk Arrow	Rotax 447	Single	5 gal	590	100	Y	\$13,055
	Hawk Classic	Rotax 447	Single	5 gal	600	100	Y	\$11,905
	Hawk AG-Plus	Rotax 447	Single	10 gal	800	100	Y	\$13,463
Phantom Aircraft	Phantom X-1	Rotax 447	Single	5 gal	510	100	Y	\$10,488
		Rotax 503	Single	5 gal	510	100	Y	\$10,847
		Rotax 582	Single	5 gal	510	100	Y	\$13,697
	Phantom X-1e	Rotax 447	Single	5 gal	545	100	Y	\$12,606
Rans Inc.	S-4 Coyote	Rotax 447	Single	9 gal	587	95	Y	\$11,470
		Rotax 503 SC	Single	9 gal	587	95	Y	\$12,115
		Rotax 503 DC	Single	9 gal	587	95	Y	\$12,270
	S-5 Coyote	Rotax 447	Single	9 gal	587	95	Y	\$11,770
		Rotax 503 SC	Single	9 gal	587	95	Y	\$12,415
		Rotax 503 DC	Single	9 gal	587	95	Y	\$12,570
	S-9 Chaos	Rotax 503 SC	Single	9 gal	670	130	Y	\$11,820
		Rotax 503 DC	Single	9 gal	670	130	Y	\$11,950
		Rotax 582	Single	9 gal	710	130	Y	\$13,640
	S-14 Airaile	Rotax 447	Single	9 gal	675	120	Y	\$12,975
		Rotax 503 SC	Single	9 gal	750	120	Y	\$13,620
		Rotax 503 DC	Single	9 gal	750	120	Y	\$13,750
		Rotax 582	Single	9 gal	775	120	Y	\$15,170
	S-17 Stinger	Rotax 912	Single	9 gal	N/A	120	Y	\$22,010
		Rotax 912S	Single	9 gal	N/A	120	Y	\$23,915
		Rotax 447	Single	5 gal	527	95	Y	\$10,840
		Rotax 503 SC	Single	5 gal	536	95	Y	\$11,485
		Rotax 503 DC	Single	5 gal	536	95	Y	\$11,640
Kolb Aircraft	Firefly	Rotax 447	Single	5 gal	500	80	Y	\$10,500
	Firestar	Rotax 447	Single	5 gal	725	90	Y	\$11,500
		Rotax 503	Single	5 gal	725	90	Y	\$12,500
Skystar Aircraft Corp.	Kitfox Lite	2si 460F 35	Single	5 gal	550	63	N	\$23,570
		2si 460F 35	Single	5 gal	550	63	Y	\$19,595
		Rotax 503	Single	5 gal	550	80	Y	\$22,157
Average Cost								\$13,661
Sources: www.rans.com, www.cgsaviation.com, www.phantomaircraft.com, www.quicksilveraircraft.com, www.titanaircraft.com., www.ultralight.ca, and www.interplaneaircraft.com								
www.tnkolbaircraft.com, www.skystar.com November, 2002, Ultralight Flying Magazine, January, 2002								

Table C.6 Two Place Airplanes							
Manufacturer	Model	Engine	Place	Fuel Cap.	Weight (lbs)	V _(ne) (in mph)	Kit Cost
Interplane	SkyBoy	Rotax 503	Two	10 gal	990	103	N \$21,900
		Rotax 912	Two	10 gal	990	103	N \$26,900
Aircraft Sales & Parts	Chinook Plus 2	Rotax 503 B	Two	10 gal	1000	115	Y \$14,495
		Rotax 503 E	Two	10 gal	1000	115	Y \$15,355
		Rotax 582 E	Two	10 gal	1000	115	Y \$18,255
		HKS 700 E	Two	10 gal	1000	115	Y \$21,050
		Rotax 912	Two	10 gal	1000	115	Y \$24,795
	Beaver RX 550 Plus	Rotax 503 B	Two	10 gal	1050	105	Y \$14,595
		Rotax 503 E	Two	10 gal	1050	105	Y \$15,695
		Rotax 582 E	Two	10 gal	1050	105	Y \$18,595
		HKS 700 E	Two	10 gal	1050	105	Y \$21,395
	Quicksilver	GT 500	Two	16 gal	1000	103	Y \$26,995
		Rotax 582	Two	16 gal	1000	103	N \$32,695
		Rotax 912	Two	16 gal	1100	103	Y \$33,995
		MXL II Sport	Two	6 gal	720	75	Y \$13,495
		Rotax 582	Two	6 gal	720	75	Y \$15,495
		Sport 2S	Two	6 gal	996	87	Y \$16,795
		MX II Sprint	Two	6 gal	720	75	Y \$12,995
CGS Aviation	Hawk Arrow	Rotax 582	Two	6 gal	720	75	Y \$14,995
		Rotax 582	Two	6 gal	720	75	Y \$14,995
CGS Aviation	Hawk Classic	Rotax 503	Two	10 gal	950	100	Y \$16,330
		Rotax 503	Two	10 gal	950	100	Y \$15,090
Rans Inc.	S-6ES Coyote II	Rotax 503 SC	Two	18 gal	1000	120	Y \$17,720
		Rotax 503 DC	Two	18 gal	1000	120	Y \$17,850
		Rotax 582	Two	18 gal	1030	120	Y \$19,690
		Rotax 912	Two	18 gal	1100	120	Y \$27,400
		Rotax 912S	Two	18 gal	1100	120	Y \$29,205
	S-6S XL Coyote II	Rotax 503 SC	Two	9 gal	1000	120	Y \$17,105
		Rotax 503 DC	Two	9 gal	1000	120	Y \$17,235
		Rotax 582	Two	9 gal	1030	120	Y \$19,075
		Rotax 912	Two	9 gal	1100	120	Y \$26,785
		Rotax 912S	Two	9 gal	1100	120	Y \$28,590
	S-6S Super Coyote II	Rotax 503 SC	Two	9 gal	1000	120	Y \$19,720
		Rotax 503 DC	Two	9 gal	1000	120	Y \$19,850
		Rotax 582	Two	9 gal	1030	120	Y \$21,690
		Rotax 912	Two	9 gal	1100	120	Y \$29,400
		Rotax 912S	Two	9 gal	1100	120	Y \$31,205
	S-7 Courier	Rotax 912	Two	18 gal	1200	130	Y \$27,745
		Rotax 912S	Two	18 gal	1200	130	Y \$29,550
	S-10 Sakota	Rotax 582	Two	18 gal	960	130	Y \$17,455
		Rotax 912	Two	18 gal	1010	130	Y \$25,140
	S-12XL Airaile	Rotax 912S	Two	18 gal	1010	130	Y \$26,945
		Rotax 503 SC	Two	9 gal	920	100	Y \$15,020
	S-12S Super Airaile	Rotax 503 DC	Two	9 gal	920	100	Y \$15,150
		Rotax 582	Two	9 gal	975	100	Y \$16,840
		Rotax 912	Two	9 gal	1100	100	Y \$24,450
		Rotax 912S	Two	9 gal	1100	100	Y \$26,355
		Rotax 912	Two	18 gal	1150	120	Y \$28,750
	S-18 Stinger II	Rotax 912 S	Two	18 gal	1150	120	Y \$30,455
		Rotax 503 DC	Two	9 gal	920	90	Y \$16,630
		Rotax 582	Two	9 gal	1100	90	Y \$18,320
		Rotax 912	Two	9 gal	1100	90	Y \$25,440
Kolb Aircraft Inc.	Mark III Extra	Rotax 582	Two	10 gal	1000	110	Y \$17,500
		Rotax 912	Two	10 gal	1000	110	Y \$23,550
		Jabiru 2200	Two	10 gal	1000	110	Y \$22,000
	Mark III Classic	Rotax 503	Two	10 gal	1000	100	Y \$13,650
		Rotax 582	Two	10 gal	1000	100	Y \$15,500
		Rotax 912	Two	10 gal	1000	100	Y \$21,550
		Jabiru 2200	Two	10 gal	1000	100	Y \$20,000
	Kolbra	Rotax 582	Two	10 gal	1000	110	Y \$17,500
		Rotax 582	Two	10 gal	1000	110	Y \$17,500

Firestar	Jabiru 2200	Two	10 gal	1000	110	Y	\$22,000	
	Rotax 447	Two	10 gal	725	90	Y	\$11,500	
	Rotax 503	Two	10 gal	725	90	Y	\$12,500	
SkyStar Aircraft Corp.	Kitfox Classic IV	Rotax 503	Two	13 gal	1050	94	Y	\$22,362
		Rotax 582	Two	13 gal	1200	105	Y	\$23,958
		Rotax 912	Two	13 gal	1200	117	Y	\$30,116
		Rotax 912 S	Two	13 gal	1200	122	Y	\$31,106
	Kitfox Sport	Rotax 912	Two	26 gal	1232	125	Y	\$32,285
		Rotax 912S	Two	26 gal	1232	125	Y	\$33,885
	Kitfox Lite (Squared)	Rotax 503	Two	10 gal	1050	94	Y	\$23,095
		Rotax 582	Two	10 gal	1200	105	Y	\$24,882
		Rotax 912	Two	10 gal	1200	117	Y	\$31,222
		Rotax 912 S	Two	10 gal	1200	122	Y	\$32,343
Average Cost							\$21,961	
Sources: www.rans.com, www.cgsaviation.com, www.phantomaircraft.com, www.quicksilveraircraft.com, www.titanaircraft.com., www.ultralight.ca, and www.interplaneaircraft.com www.tnkolbaircraft.com, www.skystar.com November, 2002, Ultralight Flying Magazine, January, 2002								

The following tables were calculated by using the data presented in Table C.1 through Table C.6. In these six tables there are more kit-built fixed-wing airplanes available than both kit-built powered parachutes and kit-built weight-shift-control aircraft combined. Also, there are less factory-built fixed-wing airplanes than both factory-built powered parachutes and factory-built weight-shift-control aircraft combined. Because of this, the average kit-built light-sport aircraft is more expensive than the average factory-built light-sport aircraft as evident in Table C.7 and Table C.10. However, the FAA expects more fixed-wing airplanes will be available in the factory-built form after the rule is published. This will occur because of an increased demand to provide instruction in two-place fixed-wing airplanes that meet the consensus standard and can be issued a special light-sport airworthiness certificate.

Table C.7 Average Cost of a Kit Built Light Sport Aircraft	
	Avg. Cost
Powered Parachutes	\$13,814
Weight Shift Control	\$15,423
Airplanes	\$18,922
Average Cost of All Sport Aircraft	\$17,989

Table C.8 Average Cost of a Manufactured Single Place Light Sport Aircraft	
	Avg. Cost
Powered Parachute	\$9,923
Weight Shift Control	\$9,768
Airplanes	\$23,570
Average Cost for Single Place LSA	\$11,532

Table C.9 Average Cost of a Manufactured Two Place Light Sport Aircraft	
	Avg. Cost
Powered Parachute	\$13,930
Weight Shift Control	\$14,449
Airplanes	\$27,165
Average Cost for Two Place LSA	\$15,972

Table C.10 Average Cost of a Manufactured Light Sport Aircraft	
	Avg. Cost
Powered Parachutes	\$12,928
Weight Shift Control	\$13,217
Airplanes	\$26,266
Average Cost of All Sport Aircraft	\$15,587

XII. Appendix D – Comparison of Certification Practices

The following tables illustrate a comparison between the requirements for a flight instructor with a sport pilot rating, a sport pilot certificate and the annual inspection requirements for light-sport aircraft, set forth by the rule and the requirements currently used by the USUA, EAA and ASC. The FAA obtained this information via the trade organizations websites or forms previously on file within the FAA. In general, the requirements to become a flight instructor with a sport pilot rating in any category exceed the requirements currently being used by the trade organizations. The experience requirements are at least fifty hours higher under the rule as compared to the current practices for any category rating. Also, the requirements to become a sport pilot in any category, exceed the requirements currently being used by the trade organizations.

Table D.1 Requirements to be a Flight Instructor (Fixed Wing/Airplane)					
	Experience Requirements	Practical or Flight Test	Written or Knowledge Test	Oral Test	Fundamentals Of Instructing Exam
EAA	Minimum 100 hours and 15 hours in an Ultralight	Yes	Yes	Yes	Yes
USUA	Minimum 100 hours and 20 hours in an Ultralight	Yes	Yes	Yes	Yes
ASC	Minimum of 40 hours and 15 hours in air and ground instruction	Information Not Readily Available	Yes	Information Not Readily Available	Yes
FAA	Minimum of 150 hours of flight time as a pilot	Yes	Yes	Yes	Yes
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003					

Table D.2 Requirements to be a Flight Instructor (Weight Shift Control)					
	Experience Requirements	Practical or Flight Test	Written or Knowledge Test	Oral Test	Fundamentals Of Instructing Exam
EAA	Not Available Online	Yes	Yes	Yes	Yes
USUA	Minimum 100 hours and 20 hours in an Ultralight	Yes	Yes	Yes	Yes
ASC	Minimum of 40 hours and 15 hours in air and ground instruction	Information Not Readily Available	Yes	Information Not Readily Available	Yes
FAA	150 hours as a pilot	Yes	Yes	Yes	Yes
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003					

Table D.3 Requirements to be a Flight Instructor (Powered Parachute)					
	Experience Requirements	Practical or Flight Test	Written or Knowledge Test	Oral Test	Fundamentals Of Instructing Exam
EAA	Minimum of 25 hours and 10 hours in air and ground instruction	Yes	Yes	Yes	Yes
USUA	Information Not Available Online	Yes	Yes	Yes	Yes
ASC	Minimum of 25 hours and 10 hours in air and ground instruction	Information Not Readily Available	Yes	Information Not Readily Available	Yes
FAA	Minimum of 100 hours of flight time as a pilot	Yes	Yes	Yes	Yes
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003					

Table D.4 Requirements to be an Ultralight Pilot/Sport Pilot (Fixed Wing Airplane)				
	Experience Requirements	Practical or Flight Test	Written or Knowledge Test	Oral Test
EAA	Minimum of 10 hours in an Ultralight	Yes	Yes	Yes
USUA	Between 10 & 15 hours in an Ultralight	Yes	Yes	Yes
ASC	Information Not Readily Available	Readily Available	Information Not Readily Available	Information Not Readily Available
FAA	Minimum of 20 hours in a single engine aircraft	Yes	Yes	No
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				

Table D.5 Requirements to be an Ultralight Pilot/Sport Pilot (Powered Parachute)				
	Experience Requirements	Practical or Flight Test	Written or Knowledge Test	Oral Test
EAA	hours in an Ultralight	Yes	Yes	Yes
USUA	hours in an Ultralight	Yes	Yes	Yes
ASC	Information Not Readily Available	Readily Available	Information Not Readily Available	Readily Available
FAA	Minimum of 20 hours in a Powered Parachute	Yes	Yes	No
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				

Table D.6 Requirements to be an Ultralight Pilot/Sport Pilot (Weight Shift Control/Trike)				
	Experience Requirements	Practical or Flight Test	Written or Knowledge Test	Oral Test
EAA	Minimum of 10 hours in an Ultralight	Yes	Yes	Yes
USUA	Between 10 & 15 hours in an Ultralight	Yes	Yes	Yes
ASC	Information Not Readily Available	Information Not Readily Available	Information Not Readily Available	Information Not Readily Available
FAA	Minimum of 20 hours in a Weight Shift Control Aircraft	Yes	Yes	No
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				

Table D.7 Inspection Requirements		
	Aircraft Used for Instruction	Aircraft Not Used for Instruction
EAA	Every 100 hours, or Annual Whichever Occurs First	Not Required
USUA	Every 100 hours, or Annual Whichever Occurs First	Information Not Readily Available
ASC	Every 100 hours, or Annual Whichever Occurs First	Recommended, But Not Required
FAA	Every 100 hours, or Annual Whichever Occurs First	Annual
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003		

XIII. Appendix E – Other Costs

Costs in this section are included in costs that were estimated above in the regulatory evaluation, but were not reported separately above. For instance the cost of training DAR's is presented in this appendix. These costs are not indicated in the main regulatory evaluation because we expect that the fee that a DAR charges would allow him to recover his training costs and therefore we conclude that the DAR cost includes the training cost.

§21.190 (c)(2) states that the manufacturer must determine that the aircraft complies with the industry-developed consensus airworthiness standards. This cost is calculated by multiplying the number of manufacturers of light sport aircraft, either simple or complex, by the number of models they produce per year, by the time, in hours, it takes to determine if the aircraft complies with the consensus standards, then by the management personnel's and clerical personnel's respective wage rate. The product also reflects that management personnel puts in 75% of total time into determining if the aircraft meets the consensus standards and the clerical personnel contributes 25% of the total time to determine if the aircraft meets the consensus standards. The FAA estimated that the cost of complying with this requirement will be approximately \$1.5 million (\$1.0 million discounted), as shown in Table E.1.

Table E.1. Cost to determine if Aircraft Complies with the Consensus Standards							
21.190 (c) (2)							
Simple Class Aircraft							
Year	# of manufacturers	Models per year	Hours per model	Manufacturer wage_management	Manufacturer wage_clerical	Undiscounted Cost	Discounted Cost
	a	b	c	d	e	(a x b (c x .75) x d) + (a x b (c x .25) x e)	
2004	28	2	12	\$55.00	\$17.93	\$30,732	\$28,722
2005	28	2	12	\$55.00	\$17.93	\$30,732	\$26,843
2006	28	2	12	\$55.00	\$17.93	\$30,732	\$25,087
2007	28	2	12	\$55.00	\$17.93	\$30,732	\$23,445
2008	28	2	12	\$55.00	\$17.93	\$30,732	\$21,912
2009	28	2	12	\$55.00	\$17.93	\$30,732	\$20,478
2010	28	2	12	\$55.00	\$17.93	\$30,732	\$19,138
2011	28	2	12	\$55.00	\$17.93	\$30,732	\$17,886
2012	28	2	12	\$55.00	\$17.93	\$30,732	\$16,716
2013	28	2	12	\$55.00	\$17.93	\$30,732	\$15,623
2004-2013						\$307,322	\$215,850
Complex Class Aircraft							
Year	# of manufacturers	Models per year	Hours per model	Manufacturer wage_management	Manufacturer wage_clerical	Undiscounted Cost	Discounted Cost
2004	17	1	150	\$55.00	\$17.93	\$116,618	\$108,989
2005	17	1	150	\$55.00	\$17.93	\$116,618	\$101,859
2006	17	1	150	\$55.00	\$17.93	\$116,618	\$95,195
2007	17	1	150	\$55.00	\$17.93	\$116,618	\$88,967
2008	17	1	150	\$55.00	\$17.93	\$116,618	\$83,147
2009	17	1	150	\$55.00	\$17.93	\$116,618	\$77,707
2010	17	1	150	\$55.00	\$17.93	\$116,618	\$72,624
2011	17	1	150	\$55.00	\$17.93	\$116,618	\$67,873
2012	17	1	150	\$55.00	\$17.93	\$116,618	\$63,432
2013	17	1	150	\$55.00	\$17.93	\$116,618	\$59,283
2004-2013						\$1,166,179	\$819,075
Total						\$1,473,501	\$1,034,926

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

§21.190(c)(3) states that the manufacturer must determine that the aircraft conforms to the manufacturer's design data using an acceptable quality assurance system. Additionally, §21.190(c)(7) states that the manufacturer must have a final acceptance test procedure for evaluation of completed aircraft, and that records for each aircraft produced must show successful completion of the test procedure. This cost is calculated by multiplying the number new pilot aircraft and new instructor aircraft, by the time, in hours, it takes to determine if the aircraft conforms to the manufacturer's design data, then by the management personnel's and

clerical personnel's respective wage rate. The product also reflects that management personnel puts in 75% of total time into determining if the aircraft meets the consensus and the clerical personnel contributes 25% of the total time to determine if the aircraft conforms to the manufacturer's design data. In the table below provision 21.190 (c) (3) accounts for 10.3 hours of the time and provision 21.190 (c) (7) accounts for 2 hours of the time. The FAA estimated that the cost of complying with these requirements will be approximately \$11.1 million (\$7.3 million, discounted), as shown in Table E.2.

Table E.2. Cost to Determine if Aircraft Conforms to the Manufacturer's Design Data						
21.190 (c) (3) (7)						
Year	# of new pilot aircraft, new instructor aircraft and replacement aircraft ¹	Hours	Manufacturer wage_management	Manufacturer wage_clerical	Undiscounted Cost	Discounted Cost
	a	b	c	d	$(a \times (b \times .75) \times c) + (a \times (b \times .25) \times d)$	
2004	500	12.3	\$55.00	\$17.93	\$281,255	\$262,855
2005	1,000	12.3	\$55.00	\$17.93	\$562,510	\$491,318
2006	1,815	12.3	\$55.00	\$17.93	\$1,020,955	\$833,404
2007	1,815	12.3	\$55.00	\$17.93	\$1,020,955	\$778,882
2008	2,618	12.3	\$55.00	\$17.93	\$1,472,651	\$1,049,979
2009	2,033	12.3	\$55.00	\$17.93	\$1,143,582	\$762,017
2010	2,348	12.3	\$55.00	\$17.93	\$1,320,773	\$822,511
2011	2,348	12.3	\$55.00	\$17.93	\$1,320,773	\$768,702
2012	2,663	12.3	\$55.00	\$17.93	\$1,497,963	\$814,793
2013	2,663	12.3	\$55.00	\$17.93	\$1,497,963	\$761,489
2004-2013					\$11,139,381	\$7,345,949
Notes:						
1) This provision only applies to factory built aircraft and coincides with Column F in Table 2A.						
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						

The FAA estimated that the cost of completing applications and writing renewal letters for DARs and DPEs will be approximately \$83,000 (\$63,000, discounted), as shown in Tables E.3, E.4,

and E.5. Tables E.3 and E.4 represent the cost for the DARs to complete applications and write renewal letters using forms 8110-14 and 8110-28, while E.5 represents the costs for DPEs to complete and write renewal letters using form 8710-6. This cost was calculated by multiplying the respective number of DARs and DPEs who will complete the applications and renewal letters, by the amount of time, in hours, to complete the applications and renewal letters, then by their respective wage rates. Their product was the totaled and discounted accordingly.

Table E.3. Cost of DAR Applications and Renewals							
8110-14							
Year	# of DAR Applications	# of DAR Renewals	Application Hours	Renewal Hours	DAR Wage	Undiscounted Cost	Discounted Cost
2004	100	0	1	1	\$65.00	\$6,500	\$6,075
2005	0	100	1	1	\$65.00	\$6,500	\$5,677
2006	0	0	1	1	\$65.00	\$0	\$0
2007	50	0	1	1	\$65.00	\$3,250	\$2,479
2008	10	17	1	1	\$65.00	\$1,733	\$1,236
2009	10	17	1	1	\$65.00	\$1,733	\$1,155
2010	10	17	1	1	\$65.00	\$1,733	\$1,079
2011	10	17	1	1	\$65.00	\$1,733	\$1,009
2012	10	17	1	1	\$65.00	\$1,733	\$943
2013	10	17	1	1	\$65.00	\$1,733	\$881
2004-2013						\$26,650	\$20,535
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003							

Table E.4. Cost of Applications and Renewal Letters							
8110-28							
Year	# of DAR Applications	# of DAR Renewals	Application Hours	Renewal Hours	DAR Wage	Undiscounted Cost	Discounted Cost
2004	200	0	0.92	0.92	\$65.00	\$11,917	\$11,137
2005	0	200	0.92	0.92	\$65.00	\$11,917	\$10,408
2006	0	0	0.92	0.92	\$65.00	\$0	\$0
2007	100	0	0.92	0.92	\$65.00	\$5,958	\$4,546
2008	20	33	0.92	0.92	\$65.00	\$3,178	\$2,266
2009	20	33	0.92	0.92	\$65.00	\$3,178	\$2,117
2010	20	33	0.92	0.92	\$65.00	\$3,178	\$1,979
2011	20	33	0.92	0.92	\$65.00	\$3,178	\$1,849
2012	20	33	0.92	0.92	\$65.00	\$3,178	\$1,729
2013	20	33	0.92	0.92	\$65.00	\$3,178	\$1,615
2004-2013						\$48,858	\$37,647
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003							

Table E.5. Cost for Applications and Renewal Letters					
8710-6					
Year	# of DPEs	Hours	DPE Wage	Undiscounted Cost	Discounted Cost
2004	5	0.5	\$100.00	\$250	\$234
2005	5	0.5	\$100.00	\$250	\$218
2006	5	0.5	\$100.00	\$250	\$204
2007	5	0.5	\$100.00	\$250	\$191
2008	5	0.5	\$100.00	\$250	\$178
2009	5	0.5	\$100.00	\$250	\$167
2010	5	0.5	\$100.00	\$250	\$156
2011	5	0.5	\$100.00	\$250	\$146
2012	5	0.5	\$100.00	\$250	\$136
2013	5	0.5	\$100.00	\$250	\$127
2004-2013				\$2,500	\$1,756
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003					

§21.190 (c)(5) requires manufacturers to state that they will monitor and correct safety-of-flight issues, using a continued airworthiness system that meets the identified consensus standard. This cost is calculated by multiplying the number of manufacturers of light sport aircraft, either simple or complex, by the time, in hours, it takes to monitor and correct safety-of-flight issues, then by the management personnel's and clerical personnel's respective wage rate. The product also reflects that management personnel puts in 50% of total time into monitoring and correcting safety-of-flight issues, using a continued airworthiness system that meets the identified consensus standard and the clerical personnel contributes 50% of the total time into monitoring and correcting safety-of-flight issues, using a continued airworthiness system that meets the identified consensus standard. The FAA estimated that the cost of complying with these requirements, over the next ten years, will be approximately \$169,200 (\$118,800, discounted), as shown in Table E.6.

Table E.6. Cost to Monitor and Correct Safety-of-Flight Issues										
21.190 (c) (5)										
Year	# of manufacturers (simple class aircraft)	Hours	# of manufacturers (complex class aircraft)	Hours	Manufacturer wage_management	Manufacturer wage_clerical	Costs to Monitor and Correct Safety-of-Flight Issues in Simple Aircraft	Costs to Monitor and Correct Safety-of- Flight Issues in Complex Aircraft	Undiscounted Cost	Discounted Cost
	a	a'	b	c	d	e	$f = (a \times (a' \times .50) \times d) + (a \times (a' \times .50) \times e)$	$g = (b \times (c \times .50) \times d) + (b \times (c \times .50) \times e)$	f + g	
2004	28	2	17	24	\$55.00	\$17.93	\$2,042	\$14,878	\$16,920	\$15,813
2005	28	2	17	24	\$55.00	\$17.93	\$2,042	\$14,878	\$16,920	\$14,778
2006	28	2	17	24	\$55.00	\$17.93	\$2,042	\$14,878	\$16,920	\$13,812
2007	28	2	17	24	\$55.00	\$17.93	\$2,042	\$14,878	\$16,920	\$12,908
2008	28	2	17	24	\$55.00	\$17.93	\$2,042	\$14,878	\$16,920	\$12,064
2009	28	2	17	24	\$55.00	\$17.93	\$2,042	\$14,878	\$16,920	\$11,274
2010	28	2	17	24	\$55.00	\$17.93	\$2,042	\$14,878	\$16,920	\$10,537
2011	28	2	17	24	\$55.00	\$17.93	\$2,042	\$14,878	\$16,920	\$9,847
2012	28	2	17	24	\$55.00	\$17.93	\$2,042	\$14,878	\$16,920	\$9,203
2013	28	2	17	24	\$55.00	\$17.93	\$2,042	\$14,878	\$16,920	\$8,601
2004-2013							\$20,420	\$148,777	\$169,198	\$118,837

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Industry has to work with the government to develop the Consensus Standards, and they have been working on this for a number of months. ASTM prepared an analysis of the current and projected costs and benefits to the Light Sport Aircraft (LSA) community resulting from standardization through ASTM International;⁵⁹ this report is included in the docket. Based on this analysis and subsequent correspondence between ASTM and the FAA, as shown in Table E.7, the FAA projects \$5.45 million (\$3.96 million, discounted) over the next ten years. This report shows sunk costs of \$1.15 million.

The costs are broken into three categories – member travel, member time, and ASTM support. For both sunk and projected costs, the largest component is member time; members have already put in about 10,100 hours and are projected to put in an additional 56,600 hours over the next ten years. ASTM support staff have already logged 1,400 hours and are projected to put in an additional 9,900 hours. Given that member travel and conferences can include both travel for

⁵⁹ ASTM International - Benefit-Cost Analysis of Committee F37 on Light Sport Aircraft to the Light Sport Aircraft Community and the FAA, 30 May 2003.

face-to-face conferences and virtual meetings and conference calls, it is impossible to project the total amount of time that would be expended.

Table E.7. Cost of Working with Government to Develop the Consensus Standards ¹						
Year	Member Travel	Member Time	ASTM Support	Total Costs	Discount Rate	Discounted Costs
2004	\$68,335	\$544,700	\$80,330	\$693,365	0.9346	\$648,005
2005	\$61,502	\$462,995	\$75,000	\$599,497	0.8734	\$523,624
2006	\$55,351	\$393,545	\$70,000	\$518,896	0.8163	\$423,574
2007	\$66,421	\$472,254	\$75,000	\$613,675	0.7629	\$468,170
2008	\$64,000	\$461,000	\$80,000	\$605,000	0.7130	\$431,357
2009	\$64,000	\$461,000	\$80,000	\$605,000	0.6663	\$403,137
2010	\$64,000	\$461,000	\$80,000	\$605,000	0.6227	\$376,764
2011	\$64,000	\$461,000	\$80,000	\$605,000	0.5820	\$352,116
2012	\$64,000	\$461,000	\$80,000	\$605,000	0.5439	\$329,080
2013	\$64,000	\$461,000	\$80,000	\$605,000	0.5083	\$307,551
2004-2013	\$635,609	\$4,639,494	\$780,330	\$5,450,433		3,955,825
Notes:						
1) ASTM International Benefit Cost Analysis of Committee F37 on Light-Sport Aircraft Community and the FAA.						
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						

Training of Designated Airworthiness Representatives (DAR's)

The costs that designated airworthiness representatives will incur to become trained are included here in the aircraft certification discussion, because before light-sport aircraft can be certified there must be DAR's to inspect and certify the light-sport aircraft. At this time, there are not enough DARs authorized to perform the light-sport inspections and certifications. These DARs are authorized already to perform certifications on amateur-built aircraft, which are considered a more complicated aircraft than the light-sport aircraft. Therefore, new DARs will be needed to provide this service of certification.

After submitting an application, which will take an hour of the DAR's time, all sport pilot DAR's will require special training. The FAA and the Transportation Safety Institute (TSI) will offer a light-sport designated airworthiness representative course in Oklahoma City. The course will be a total of three days and the student will be charged \$50 a day or \$150 for the complete course. The costs include: printing, equipment, and the instructor's travel to the meeting space, but not the instructor's salary. The cost of the instructors' salary is included in the cost of the Designee Standardization Office which can be found in the government cost section. We estimate transportation, food, hotel, and other incidentals will cost \$570, for a total of \$720 per DAR. The DAR's time costs \$34.65 an hour. Table E.8 shows costs at \$566,000 (\$435,000, discounted).

Table E.8. DAR Training Costs									
Year	Hourly Salary	Initial number applying	Number reapplying	Application Costs	Training Costs	Other Costs	Undiscounted Costs	Discount Factor	Discounted Costs
2004	\$34.65	300		\$35	\$150	\$570	\$226,506	0.9346	\$211,688
2005	\$34.65	0		\$35	\$150	\$570	\$0	0.8734	\$0
2006	\$34.65	0		\$35	\$150	\$570	\$0	0.8163	\$0
2007	\$34.65	150	0	\$35	\$150	\$570	\$113,253	0.7629	\$86,400
2008	\$34.65	30	0	\$35	\$150	\$570	\$22,651	0.7130	\$16,150
2009	\$34.65	30	50	\$35	\$150	\$570	\$60,402	0.6663	\$40,248
2010	\$34.65	30	10	\$35	\$150	\$570	\$30,201	0.6227	\$18,808
2011	\$34.65	30	27	\$35	\$150	\$570	\$43,036	0.5820	\$25,047
2012	\$34.65	30	13	\$35	\$150	\$570	\$32,466	0.5439	\$17,659
2013	\$34.65	30	19	\$35	\$150	\$570	\$36,996	0.5083	\$18,807
2004-2013							\$565,510		\$434,807
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003									

Table E.9 reflects the costs of an FAA recognized ultralight organization to develop and maintain their training courses and will cost \$23,000 (\$18,000, discounted) over the next ten years. This cost is calculated in two parts, the cost to develop the course and the cost to maintain the course. It is assumed it will take each organization 100 hours to develop the course and 10 hours, per year, to maintain to maintain their training course. It is also assumed that their

instructor staff will contribute 70% of the time to develop and maintain the training course and the clerical staff will contribute 30% of the time to develop and maintain the training course. This time, in hours, was then multiplied by the instructor's and clerical staff's respective wage rate and then totaled.

Table E.9. Cost of Organizations to Develop and Maintain Training Courses for Pilots											
Year	# of associations	Average instructor hrs to develop the course	Average clerical hrs to develop the course	Average hrs needed to maintain the course		Instructor Wage	Clerical Wage	Instructor cost to develop the course	Clerical cost to develop the course	Cost to Maintain the Course	
	a	b	c	d	e	f	g	a x b x f	a x c x g	Instructor	Clerical
2004	4	70	30	7	3	\$34.65	\$17.93	\$9,702	\$2,152	\$970	\$215
2005				7	3	\$34.65	\$17.93			\$970	\$215
2006				7	3	\$34.65	\$17.93			\$970	\$215
2007				7	3	\$34.65	\$17.93			\$970	\$215
2008				7	3	\$34.65	\$17.93			\$970	\$215
2009				7	3	\$34.65	\$17.93			\$970	\$215
2010				7	3	\$34.65	\$17.93			\$970	\$215
2011				7	3	\$34.65	\$17.93			\$970	\$215
2012				7	3	\$34.65	\$17.93			\$970	\$215
2013				7	3	\$34.65	\$17.93			\$970	\$215
2004-2013								\$9,702	\$2,152	\$8,732	\$1,936

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Training Courses

In this section we estimate the costs of buying the training courses from the associations and developing ground-training courses for instructors.

The FAA assumes that there will be one ground-training instructor for every ten new flight instructors. The ground-training instructors will provide the training and will have to purchase the manual published by the trade associations. The following tables estimate the cost to ground-training instructors who purchase pre-developed courses, and the cost that the organizations will incur in developing courses. Given the assumption of one ground-training instructor for every ten new flight instructors, Table E.10 multiplies the number of ground-training instructors times

the anticipated cost of the manual. This cost will be \$11,000 (\$7,000, discounted) over the next ten years.

Table E.10. Cost of Buying Training Courses from Associations				
Year	# of instructors purchasing training courses	Average cost for a training course	Total Undiscounted Cost	Discounted Cost
	a ¹	b	a x b	
2004	7	\$100	\$700	\$654
2005	7	\$100	\$700	\$611
2006	9	\$100	\$900	\$735
2007	9	\$100	\$900	\$687
2008	11	\$100	\$1,100	\$784
2009	11	\$100	\$1,100	\$733
2010	13	\$100	\$1,300	\$810
2011	13	\$100	\$1,300	\$757
2012	15	\$100	\$1,500	\$816
2013	15	\$100	\$1,500	\$763
2004-2013			\$11,000	\$7,349
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003				
Notes:				
1) The FAA assumes that DPE train instructors and that 1 DPE trains 10 instructors				

Table E.11 reflects the costs of an FAA recognized ultralight organization to develop and maintain their training courses and will cost \$23,000 (\$18,000, discounted) over the next ten years. This cost is calculated in two parts, the cost to develop the course and the cost to maintain the course. It is assumed it will take each organization 100 hours to develop the course and 10 hours, per year, to maintain their training course. It is also assumed that their instructor staff will contribute 70% of the time to develop and maintain the training course and the clerical staff will

contribute 30% of the time to develop and maintain the training course. This time, in hours, was then multiplied by the instructor's and clerical staff's respective wage rate and then totaled.

Table E.11. Cost of Organizations Developing Training Courses for Instructors													
Year	# of associations	Average instructor hours to develop the course	Average clerical hours to develop the course	Average Instructor hours needed to maintain the course	Average hours needed to maintain the course	Instructor Wage	Clerical Wage	Instructor cost to develop the course	Clerical cost to develop the course	Instructor cost to maintain the course	Clerical cost to maintain the course	Total Undiscounted Cost	Discounted Cost
	a	b	c	d	e	f	g	a x b x f	a x c x g	a x d x f	a x e x g	developing costs + maintenance costs	
2004	4	70	30	7	3	\$34.65	\$17.93	\$9,702	\$2,152			\$11,854	\$11,078
2005				7	3	\$34.65	\$17.93			\$970	\$215	\$1,185	\$1,035
2006				7	3	\$34.65	\$17.93			\$970	\$215	\$1,185	\$968
2007				7	3	\$34.65	\$17.93			\$970	\$215	\$1,185	\$904
2008				7	3	\$34.65	\$17.93			\$970	\$215	\$1,185	\$845
2009				7	3	\$34.65	\$17.93			\$970	\$215	\$1,185	\$790
2010				7	3	\$34.65	\$17.93			\$970	\$215	\$1,185	\$738
2011				7	3	\$34.65	\$17.93			\$970	\$215	\$1,185	\$690
2012				7	3	\$34.65	\$17.93			\$970	\$215	\$1,185	\$645
2013				7	3	\$34.65	\$17.93			\$970	\$215	\$1,185	\$603
2004-2013								\$9,702	\$2,152	\$8,732	\$1,936	\$22,522	\$18,296

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

Training of Designated Pilot Examiners

The cost that designated pilot examiners will incur to become trained are included here in the airmen certification, because before sport pilots and flight instructors with a sport pilot rating can be certified there must be sport pilot designated pilot examiners (DPE's).

All sport pilot DPE's will require special training. Before taking this training, the DPE needs to fill out form 8710-10, which is estimated to take an hour; this form is mailed (37 cents postage) to Oklahoma City. The FAA will offer a sport pilot DPE course in Oklahoma City. The course will be five days long and the student will be charged \$50 a day or \$250 for the complete five

day course. The costs include: printing, equipment, and the instructor's travel to the meeting space, but not the instructor's salary. The cost of the instructors' salary is included in the cost of the National Program Office which can be found in the government cost section. We estimate transportation, food, hotel, and other incidentals will cost \$750, for a total of \$1,000 per DPE. The training will involve 8 hours of the DPE's time with the ASI, as well as a knowledge test, which costs \$100, and takes 2 hours to complete. The DPE's time is costed out at \$34.65 per hour (note that the individual is still an instructor and not a DPE who's time is worth \$100). Table E.12 shows costs at \$511,000 (\$460,000, discounted).

Table E.12. DPE Application and Training Costs											
Year	Hourly Salary	Initial number applying	Application Costs	Training Costs	Other Costs	Test with ASI	Cost of Knowledge Test	Time for Knowledge Test	Undiscounted Costs	Discount Factor	Discounted Costs
2004	\$34.65	300	\$35	\$250	\$750	\$277	\$100	\$69	\$444,456	0.9346	\$415,379
2005	\$34.65	5	\$35	\$250	\$750	\$277	\$100	\$69	\$7,408	0.8734	\$6,470
2006	\$34.65	5	\$35	\$250	\$750	\$277	\$100	\$69	\$7,408	0.8163	\$6,047
2007	\$34.65	5	\$35	\$250	\$750	\$277	\$100	\$69	\$7,408	0.7629	\$5,651
2008	\$34.65	5	\$35	\$250	\$750	\$277	\$100	\$69	\$7,408	0.7130	\$5,282
2009	\$34.65	5	\$35	\$250	\$750	\$277	\$100	\$69	\$7,408	0.6663	\$4,936
2010	\$34.65	5	\$35	\$250	\$750	\$277	\$100	\$69	\$7,408	0.6227	\$4,613
2011	\$34.65	5	\$35	\$250	\$750	\$277	\$100	\$69	\$7,408	0.5820	\$4,311
2012	\$34.65	5	\$35	\$250	\$750	\$277	\$100	\$69	\$7,408	0.5439	\$4,029
2013	\$34.65	5	\$35	\$250	\$750	\$277	\$100	\$69	\$7,408	0.5083	\$3,766
2004-2013									\$511,124		\$460,484

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

In order to certify airmen a new type of sport pilot Designated Pilot Examiner (DPE) must be appointed, trained, supervised and renewed. The following paragraphs and tables detail the costs that will be incurred by FAA personnel reviewing DPE applications, placing, supervising and renewing DPE's.

Four FAA employees will review DPE applications. In the initial year of the rule, four FG-14's will need meet four times in the first year to review the applications, while in subsequent years, they will need to meet only once. Each meeting will last for three days. One of these employees is based in Oklahoma City, so the costs need to accommodate transportation and per diem costs for one FAA employee.⁶⁰ Table E.13 shows 10-year costs of \$75,200 (\$56,800 discounted).

Table E.13. Reviewing DPE Applications								
	a	b	c	d	ef			
Year	FG-14 wage	FG-14 personnel	FG-14 hours/yr	Trans- portation	Per Diem	Undiscounted Costs ¹	Discount Factor	Discounted Costs
2004	\$56.48	4	96	\$314	\$65	\$23,009	0.9346	\$21,504
2005	\$56.48	4	24	\$314	\$65	\$5,801	0.8734	\$5,067
2006	\$56.48	4	24	\$314	\$65	\$5,801	0.8163	\$4,735
2007	\$56.48	4	24	\$314	\$65	\$5,801	0.7629	\$4,426
2008	\$56.48	4	24	\$314	\$65	\$5,801	0.7130	\$4,136
2009	\$56.48	4	24	\$314	\$65	\$5,801	0.6663	\$3,866
2010	\$56.48	4	24	\$314	\$65	\$5,801	0.6227	\$3,613
2011	\$56.48	4	24	\$314	\$65	\$5,801	0.5820	\$3,376
2012	\$56.48	4	24	\$314	\$65	\$5,801	0.5439	\$3,155
2013	\$56.48	4	24	\$314	\$65	\$5,801	0.5083	\$2,949
2004-2013						\$75,220		\$56,827
Notes:								
1) Calculations for the year 2004 are (a x c x e) + (b x d x f) + 4(4 x g + h), and for the years 2005 - 2013 are (a x c x e) + (b x d x f) + (4 x g + h)								
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003								

⁶⁰ The FAA estimates round-trip transportation from Washington, DC to Oklahoma City at \$314, as round trip airfare from Reagan National Airport being \$286 and from Dulles Airport being \$342. Per diem costs are \$65 in Oklahoma City.

The FAA will also need to spend time placing DPE's. Several steps are involved, starting out with a FG-11 loading a list of DPE's into a database. The FAA estimates that it will take an FG-11 level employee 5 minutes to enter the information for each DPE applicant. When FSDO's have openings, they call an employee at the FG-12 level for the top three people; the FAA assumes that all 300 DPE's will be placed in 2004, but only 30% will be placed thereafter. The FG-11 has to spend 20 minutes copying specific information to be forwarded to the light-sport program office. This material is then mailed; to be conservative, the FAA is assumed postage costs of \$5 per package. This office will e-mail the name of the selectee. Applications are kept for two years, after which an employee at the FG-11 level will purge and shed them quarterly,

Table E.14. Cost of Placing DPE's										
Year	Number of DPE's applying	Number of DPE's placed	FG-11 wage rate	Enter DPE applicant's test results into database	Get information on top 3 DPE's for FSDO	Mails information to FSDO	Quarterly purging of old DPE information	Undiscounted Costs	Discount Factor	Discounted Costs
	a	b	c	$d = (a \times c) / 12$	$e = (b \times c) / 12$	$f = 5 \times b$	$g = 2 \times c$			
2004	300	300	\$33.54	\$839	\$3,354	\$1,500	\$67	\$5,760	0.9346	\$5,383
2005	100	30	\$33.54	\$280	\$335	\$150	\$67	\$832	0.8734	\$727
2006	100	30	\$33.54	\$280	\$335	\$150	\$67	\$832	0.8163	\$679
2007	100	30	\$33.54	\$280	\$335	\$150	\$67	\$832	0.7629	\$635
2008	100	30	\$33.54	\$280	\$335	\$150	\$67	\$832	0.7130	\$593
2009	100	30	\$33.54	\$280	\$335	\$150	\$67	\$832	0.6663	\$554
2010	100	30	\$33.54	\$280	\$335	\$150	\$67	\$832	0.6227	\$518
2011	100	30	\$33.54	\$280	\$335	\$150	\$67	\$832	0.5820	\$484
2012	100	30	\$33.54	\$280	\$335	\$150	\$67	\$832	0.5439	\$453
2013	100	30	\$33.54	\$280	\$335	\$150	\$67	\$832	0.5083	\$423
2004-2013				\$3,359	\$6,369	\$2,850	\$670	\$13,248		\$10,449

Source: U.S. Dept. of Trans., FAA, APO 310, November 2003

taking 2 hours a quarter to accomplish this task. If not selected, DPE's reapply every two years; the FAA assumes that one third of them will reapply. Table E.14 shows 10-year costs of \$13,200 (\$10,400, discounted).

Over 10 years, the cost to supervise DPEs will be approximately \$773,000 (\$628,000, discounted), as shown in Table E.15. Each DPE will require 24 hours of supervision per year. The estimated cost per employee in an hourly basis, which includes fringe benefits, is \$56.48⁶¹.

Table E.15. Cost to Supervise DPE's						
Years	Number of DPEs	Hours	Hourly Salary	Undiscounted Cost	Discount Factor	Discounted Costs
2004	300	24	\$56.48	\$406,659	0.9346	\$380,055
2005	30	24	\$56.48	\$40,666	0.8734	\$35,519
2006	30	24	\$56.48	\$40,666	0.8163	\$33,195
2007	30	24	\$56.48	\$40,666	0.7629	\$31,024
2008	30	24	\$56.48	\$40,666	0.7130	\$28,994
2009	30	24	\$56.48	\$40,666	0.6663	\$27,097
2010	30	24	\$56.48	\$40,666	0.6227	\$25,325
2011	30	24	\$56.48	\$40,666	0.5820	\$23,668
2012	30	24	\$56.48	\$40,666	0.5439	\$22,120
2013	30	24	\$56.48	\$40,666	0.5083	\$20,672
2004-2013				\$772,652		\$627,669
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003						

To develop practical test standards requires 220 hours of which 200 have already been completed, and to develop the knowledge test standards requires 160 hours of which 60 have already been completed. The estimated cost per employee in an hourly basis, which includes fringe benefits, is \$56.48⁶². The estimated costs that remain to develop the tests is approximately \$7,000 (\$6,000 discounted), as displayed in Table E.16.

⁶¹ \$88,697 (Salary of a GS-14 step 5 for Washington, DC)/2080 hours) x 1.3245 (fringe benefits)

⁶² \$88,697 (Salary of a GS-14 step 5 for Washington, DC)/2080 hours) x 1.3245 (fringe benefits)

Table E.16. Cost to Develop Practical Test Standards and Knowledge Test Standards to Test Airmen					
Years	Hours ¹	Hourly Salary ²	Undiscounted Cost	Discount Factor	Total Discounted Costs
2004	120	\$56	\$6,778	0.9346	\$6,334
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003					
Notes:					
1) Practical test standards require 220 hours of which 200 have already been completed, whereas the knowledge test standards require 160 hours of which 60 have already been completed.					
2) \$56 = \$88,697/2,080 hours (Hourly salary of a GS-14 step 5 for Washington, DC) x 1.3245 (fringe benefits).					

The FAA estimated that the cost to review and process part 61 instructor applications will be approximately \$24,000 (\$19,000, discounted), as shown in Table E.17. It is assumed it will take a GS-10 employee 10 minutes to review the original flight instructor application or renewal and 10 minutes to process each original flight instructor application or renewal for a total of 20 minutes or .33 of one hour as expressed in the table. The population of existing and new flight instructors was multiplied by this time it takes to review and process each original flight instructor application or renewal and by the GS-10 wage rate, then totaled and discounted accordingly.

Table E.17. Cost of Reviewing and Processing Original Flight Instructor Applications and Renewals (Part 61)					
Year	# of existing and new instructors	Hours	GS-10 Wage	Undiscounted Cost	Discounted Cost
2004	770	0.33	\$30.52	\$7,835	\$7,322
2005	670	0.33	\$30.52	\$6,817	\$5,954
2006	90	0.33	\$30.52	\$916	\$748
2007	90	0.33	\$30.52	\$916	\$699
2008	110	0.33	\$30.52	\$1,119	\$798
2009	110	0.33	\$30.52	\$1,119	\$746
2010	130	0.33	\$30.52	\$1,323	\$824
2011	130	0.33	\$30.52	\$1,323	\$770
2012	150	0.33	\$30.52	\$1,526	\$830
2013	150	0.33	\$30.52	\$1,526	\$776
2004-2013				\$24,420	\$19,466
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003					

XIV. Appendix F. Estimation of the Cost of Strictly Enforcing the Current Rule

F.1. Aircraft Certification

For the ultralights there are no certification standards under part 103 and they do not have to be inspected. For instructor aircraft they are already produced consistent with part 23 requirements so there are no added costs associated with certification standard requirements. However, if the current regulations were to be enforced, the current aircraft used by instructors to teach ultralight student pilots would not meet the enforced rule's requirements. The instructors would likely have to rent planes that can be certified for instruction. Concerning private and recreational use of ultralight like aircraft, there would be no type design costs because many of the ultralight-like aircraft were built from a kit and no certification design requirements are necessary. The ones that have not been kit built cannot be design certified. There will be, however, certification costs associated with strict enforcement of the current rules. Aircraft will now need to be inspected and registered. The FAA estimates the cost of a DAR inspecting an ultralight like aircraft is \$650. Total cost over ten years for certification are \$25.7 million undiscounted and \$19.2 million discounted (see Table F.1).

Table F.1 Cost of Certifying Aircraft					
Year	Existing Pilots/Aircrafts	Existing Instructors/Aircrafts	New Pilots/Aircrafts		Discounted Cost
	a ¹	b	c	Cost \$650* (a+b+c)	
2004	7,000	700	400	\$5,265,000	\$4,920,561
2005	7,000	600	400	\$5,200,000	\$4,541,881
2006	1,400	130	800	\$1,514,500	\$1,236,283
2007	1,400	130	800	\$1,514,500	\$1,155,405
2008	1,400	130	1,200	\$1,774,500	\$1,265,194
2009	1,400	130	1,200	\$1,774,500	\$1,182,424
2010	1,400	130	1,600	\$2,034,500	\$1,266,984
2011	1,400	130	1,600	\$2,034,500	\$1,184,098
2012	1,400	130	2,000	\$2,294,500	\$1,248,056
2013	1,400	130	2,000	\$2,294,500	\$1,166,407
2004-2013	25,200	2,340	12,000	\$25,701,000	\$19,167,294
Source: U.S. Dept. of Trans., FAA, APO 310, May 2003					
Notes:					
1) The FAA assumes each pilot and instructor will have one ultralight like aircraft.					

F.2. Pilot and Instructor Qualifications

Cost to become certified as a private pilot

Under this alternative, the costs of obtaining a pilot certificate or an instructor certificate would be much higher than under the proposed rule. The candidate would receive more extensive ground training than under the proposed rule but much of the more extensive training would not be appropriate for ultralight operations. In addition, the candidate would receive more extensive flight training than under the proposed rule, but once again, much of the additional flight training would not be appropriate for ultralight operations.

Ground Training Costs

The cost of ground training includes the cost of the course, the time the student pilot devotes to studying, and the time the student pilot spends in a ground training class.

Under the current rules if strictly enforced student pilots would spend 20 hours in a class and another 60 hours studying at home. Under current practices, student pilots taking ground training from FAA recognized ultralight organizations would spend 7 hours in class and another 14 hours studying at home. Ground training for non-association members may be somewhat different, however, association members make up 75 percent of all sport pilots. For Table F.2 we estimate that 13 hours of instruction time and 46 hours of home study time is the difference between the current rule and current practice. Total ground training costs are \$52.8 million undiscounted or \$41.6 million discounted.

Knowledge Test

Provision § 61.357 stipulates that one must take and pass a knowledge test in order to receive sport pilot certification. Before taking the knowledge test, the applicant must receive a logbook endorsement from an authorized instructor. The costs of the knowledge test requirement are presented in Table F.3 and include the cost of the actual test, the cost of the time to take the knowledge test, and the cost of the logbook endorsement required before taking the test. We estimated that the knowledge test lasts an estimated 3 hours and costs \$90. All sport pilot candidates would be required to take this test including those who were pilots with an ultralight organization. Included in the population that is taking the knowledge test before receiving a sport pilot certificate, are all existing instructors. This is because all instructors will have to

receive a pilot certificate before becoming certified as an instructor. Table F.3 shows total undiscounted costs of \$5.2 million and discounted costs of \$4.1 million.

For purposes of this evaluation, we estimate that 10% of the pilots will fail the knowledge test and be required to retake the test. Under provision 61.49, an applicant who fails a knowledge test may retake the test. Table F.4 displays the costs of retesting after failure. These costs include the cost of these 10% of applicants receiving additional training (the FAA assumes one hour of additional training) from an authorized instructor, and retaking the knowledge test. Taking the exam again will require 3 hour of time and \$90.00 average cost for exam. Table F.4 has undiscounted costs totaling \$606,000 and discounted \$478,000.

Table F.2 Ground Training Costs for Pilots												
61.351 and 61.353												
Year	# of existing pilots not with associations	# of new pilots	Study hours	Pilot wage	Instructor wage	Average instruction hrs	Home cost of study time	Value of students' time in class	Cost of the Class	Cost of the Course	Undiscounted Cost	Discounted Cost
	a	b	c	d	e	f	(a + b) x c x d	(a + b) x f x d	$((a + b) \times f) / 20 \times e$	(a + b) x \$55		
2004	7,700	400	46	\$31.50	\$34.65	13	\$11,736,900	\$3,316,950	\$182,432	\$445,500	\$15,681,782	\$14,655,871
2005	7,600	400	46	\$31.50	\$34.65	13	\$11,592,000	\$3,276,000	\$180,180	\$440,000	\$15,488,180	\$13,527,976
2006	0	800	46	\$31.50	\$34.65	13	\$1,159,200	\$327,600	\$18,018	\$44,000	\$1,548,818	\$1,264,297
2007	0	800	46	\$31.50	\$34.65	13	\$1,159,200	\$327,600	\$18,018	\$44,000	\$1,548,818	\$1,181,586
2008	0	1,200	46	\$31.50	\$34.65	13	\$1,738,800	\$491,400	\$27,027	\$66,000	\$2,323,227	\$1,656,429
2009	0	1,200	46	\$31.50	\$34.65	13	\$1,738,800	\$491,400	\$27,027	\$66,000	\$2,323,227	\$1,548,064
2010	0	1,600	46	\$31.50	\$34.65	13	\$2,318,400	\$655,200	\$36,036	\$88,000	\$3,097,636	\$1,929,052
2011	0	1,600	46	\$31.50	\$34.65	13	\$2,318,400	\$655,200	\$36,036	\$88,000	\$3,097,636	\$1,802,852
2012	0	2,000	46	\$31.50	\$34.65	13	\$2,898,000	\$819,000	\$45,045	\$110,000	\$3,872,045	\$2,106,136
2013	0	2,000	46	\$31.50	\$34.65	13	\$2,898,000	\$819,000	\$45,045	\$110,000	\$3,872,045	\$1,968,351
2004-2013	15,300	12,000					\$39,557,700	\$11,179,350	\$614,864	\$1,501,500	\$52,853,414	\$41,640,615

Source: U.S. Dept. of Trans., FAA, APO 310, May 2003

Table F.3 Knowledge Test Scores												
Year	# of existing and new pilots	# of existing instructors	Pilot wage	Instructor Wage	Average hrs to take the knowledge test	Average cost of the knowledge test	Logbook Endorsement Costs	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost	
	a	b	c	d	e	f ¹	$\frac{((a+b) \times 5/60 \text{ hours} \times c) + ((a+b) \times 5/60 \text{ hours} \times d)}{}$	$(a \times c \times e) + (b \times d \times e)$	$(a \times f) + (b \times f)$			
2004	7,400	700	\$31.50	\$34.65	3	\$90.00	\$44,651	\$772,065	\$729,000	\$1,545,716	\$1,444,595	
2005	7,400	600	\$31.50	\$34.65	3	\$90.00	\$44,100	\$761,670	\$720,000	\$1,525,770	\$1,332,667	
2006	800		\$31.50	\$34.65	3	\$90.00	\$4,410	\$75,600	\$72,000	\$152,010	\$124,085	
2007	800		\$31.50	\$34.65	3	\$90.00	\$4,410	\$75,600	\$72,000	\$152,010	\$115,968	
2008	1,200		\$31.50	\$34.65	3	\$90.00	\$6,615	\$113,400	\$108,000	\$228,015	\$162,572	
2009	1,200		\$31.50	\$34.65	3	\$90.00	\$6,615	\$113,400	\$108,000	\$228,015	\$151,936	
2010	1,600		\$31.50	\$34.65	3	\$90.00	\$8,820	\$151,200	\$144,000	\$304,020	\$189,328	
2011	1,600		\$31.50	\$34.65	3	\$90.00	\$8,820	\$151,200	\$144,000	\$304,020	\$176,942	
2012	2,000		\$31.50	\$34.65	3	\$90.00	\$11,025	\$189,000	\$180,000	\$380,025	\$206,708	
2013	2,000		\$31.50	\$34.65	3	\$90.00	\$11,025	\$189,000	\$180,000	\$380,025	\$193,185	
2004-2013	26,000	1,300					\$150,491	\$2,592,135	\$2,457,000	\$5,199,626	\$4,097,987	

Source: U.S. Dept. of Trans., FAA, APO 310, May 2003

Source for the average cost to take the knowledge test: ASC

Notes:

1) According to ASC, the cost of the knowledge test is between \$65 and \$120 or \$92.50 $[(65+120)/2]$ on average. We rounded it down to \$90 to avoid spurious accuracy.

Table F.4 Cost or Retesting after Pilots or Instructors Fail Knowledge Test														
Year	# of existing and new pilots	# of existing and new instructors	Pilot wage	Instructor Wage	Average hrs to take the knowledge test	Average cost of the knowledge	Average hrs needed to retrain	Logbook Endorsement Costs	Cost of time to retrain	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost	
	a ¹	b ¹	c	d	e	f ¹	g	$\frac{((a+b) \times 5/60 \text{ hours} \times c) + ((a+b) \times 5/60 \text{ hours} \times d)}{}$	$(a \times c \times h) + (b \times d \times h)$	$(a \times c \times e) + (b \times d \times e)$	$(a \times f) + (b \times f)$			
2004	740	70	\$31.50	\$34.65	3	\$90.00	1.00	\$4,465	\$25,736	\$77,207	\$72,900	\$180,307	\$168,511	
2005	740	60	\$31.50	\$34.65	3	\$90.00	1.00	\$4,410	\$25,389	\$76,167	\$72,000	\$177,966	\$155,442	
2006	80		\$31.50	\$34.65	3	\$90.00	1.00	\$441	\$2,520	\$7,560	\$7,200	\$17,721	\$14,466	
2007	80		\$31.50	\$34.65	3	\$90.00	1.00	\$441	\$2,520	\$7,560	\$7,200	\$17,721	\$13,519	
2008	120		\$31.50	\$34.65	3	\$90.00	1.00	\$662	\$3,780	\$11,340	\$10,800	\$26,582	\$18,952	
2009	120		\$31.50	\$34.65	3	\$90.00	1.00	\$662	\$3,780	\$11,340	\$10,800	\$26,582	\$17,712	
2010	160		\$31.50	\$34.65	3	\$90.00	1.00	\$882	\$5,040	\$15,120	\$14,400	\$35,442	\$22,071	
2011	160		\$31.50	\$34.65	3	\$90.00	1.00	\$882	\$5,040	\$15,120	\$14,400	\$35,442	\$20,628	
2012	200		\$31.50	\$34.65	3	\$90.00	1.00	\$1,103	\$6,300	\$18,900	\$18,000	\$44,303	\$24,098	
2013	200		\$31.50	\$34.65	3	\$90.00	1.00	\$1,103	\$6,300	\$18,900	\$18,000	\$44,303	\$22,521	
2004-2013	2,600	130						\$15,049	\$86,405	\$259,214	\$245,700	\$606,367	\$477,921	

Source: U.S. Dept. of Trans., FAA, APO 310, May 2003

Source for the average cost to take the knowledge test: ASC

Notes:

1) The FAA assumes that approximately 10% of the pilots and instructors will fail the knowledge test.

Flight Training

Provision 61.353 requires that an applicant for a private pilot certificate receive and log flight training from an authorized instructor on certain areas of operation. Single-engine class privileges on average require 65 hours in order to obtain a private pilots license. Other categories require fewer minimum number of flight hours. However, actual training might be more than the minimum required.

Table F.5 estimates the cost of the flight training requirement for private pilot applicants to get a private pilot license. All new ultralight pilots as well as existing ultralight pilots who are not already private pilots are required to take this training. Under strict enforcement of the current rule, pilots are estimated to require 65 hours of flight training to receive a private pilots license. Typically, this would constitute around 41 hours of dual and 24 hours of solo flight. Under current practice as represented by what the associations recommend they are getting only 10 hours of training. The 55-hour difference is reflected in Table F.5. These 55 hours consists generally of 35 hours dual time and 20 hours solo time. Also, for each hour of flight time there is generally on average one extra hour of instruction on the ground, yielding 110 hours total training. Added to the new pilots time is one extra hour for the briefing and logbook record keeping time.

In order to compute the out of pocket costs (average cost of training) that the new pilots actually have to pay for flight training several steps are necessary. First, the instructor pilot wage (\$34.65) is multiplied by the additional hours of dual time 35 hours in air and 35 hours on ground. The 20 hours of solo flight time are assumed to take place without an instructor. The cost of supplies \$150 and the cost of renting the airplane at \$70 per hour for an aircraft are also included. The rental of the airplane estimate includes all 55 hours of flight training both solo and dual. Thus, the average cost of training is equal to: $\$34.65 \times 2 \times 35 + \$70.00 \times 55 + \$150 = \$6,425.50$. This constitutes the out of pocket costs for flight training for a new pilot. The

estimated total cost for flight time for 27,300 student pilots over 10 years is \$270 million or \$212.7 million discounted.²

² The FAA also calculated the Flight Training costs if ultralight-like pilots had to obtain a recreation pilot certificate as an alternative to a sport pilot certificate. The FAA estimates that Flight Training costs in this scenario would equal \$239 million undiscounted or \$184 million discounted.

Table F.5 Flight Training Costs												
Year	# of existing and new pilots	Average hrs spent in training	Average briefing/debriefing hrs	Average logbook hrs	Pilot wage	Average cost of training	Cost of student pilot time needed for training	Cost of students' time needed for briefing/debriefing	Cost of the training	Logbook Endorsement Costs	Total Undiscounted Cost	Discounted Cost
	a ¹	b	c	d	e	f	(a x b x e)	(a x b x c x e)	a x f	(a x b x d x e)		
2004	8,100	55	0.92	0.08	\$31.50	\$6,426	\$14,033,250	\$12,863,813	\$52,046,550	\$1,169,438	\$80,113,050	\$74,872,009
2005	8,000	55	0.92	0.08	\$31.50	\$6,426	\$13,860,000	\$12,705,000	\$51,404,000	\$1,155,000	\$79,124,000	\$69,109,966
2006	800	55	0.92	0.08	\$31.50	\$6,426	\$1,386,000	\$1,270,500	\$5,140,400	\$115,500	\$7,912,400	\$6,458,875
2007	800	55	0.92	0.08	\$31.50	\$6,426	\$1,386,000	\$1,270,500	\$5,140,400	\$115,500	\$7,912,400	\$6,036,332
2008	1,200	55	0.92	0.08	\$31.50	\$6,426	\$2,079,000	\$1,905,750	\$7,710,600	\$173,250	\$11,868,600	\$8,462,148
2009	1,200	55	0.92	0.08	\$31.50	\$6,426	\$2,079,000	\$1,905,750	\$7,710,600	\$173,250	\$11,868,600	\$7,908,549
2010	1,600	55	0.92	0.08	\$31.50	\$6,426	\$2,772,000	\$2,541,000	\$10,280,800	\$231,000	\$15,824,800	\$9,854,890
2011	1,600	55	0.92	0.08	\$31.50	\$6,426	\$2,772,000	\$2,541,000	\$10,280,800	\$231,000	\$15,824,800	\$9,210,178
2012	2,000	55	0.92	0.08	\$31.50	\$6,426	\$3,465,000	\$3,176,250	\$12,851,000	\$288,750	\$19,781,000	\$10,759,553
2013	2,000	55	0.92	0.08	\$31.50	\$6,426	\$3,465,000	\$3,176,250	\$12,851,000	\$288,750	\$19,781,000	\$10,055,657
2004-2013	27,300						\$47,297,250	\$43,355,813	\$175,416,150	\$3,941,438	\$270,010,650	\$212,728,158
Source: U.S. Dept. of Trans., FAA, APO 310, May 2003												
Notes:												
1) The FAA assumes that approximately 25% of existing pilots and 100% of new pilots will need flight training.												

Practical Test

Under provision 61.357 all private pilot applicants have to pass a practical test. The practical or flight test is given by a DPE and takes approximately four hours. As a prerequisite to taking the practical test, provision 61.39 of the CFR states that the applicant must have a logbook endorsement signed by an authorized instructor. Each practical test costs \$300 and takes 3 hours on average. Table F.6 shows the cost of logbook endorsement, the cost of the practical test and the cost of pilots' time to take the test. An estimated 10% who take the practical test fail it. Table V.7 illustrates the cost of an additional training for the retest and the cost of reapplying to take the test (FAA form 8710-1) after failure and the cost of taking the test again. In the case of the practical test only the parts of the exam failed earlier need to be repeated. The FAA estimates on average those who failed would require an additional two hours to take the parts of the practical test failed again. Table F.6 has \$10.9 million in cost or \$8.6 million discounted. Table F.7 shows \$936,000 in cost and \$738,000 discounted cost.

Table F.6 Practical Test Costs												
Year	# of existing and new pilots	# of existing instructors	Pilot wage	Instructor Wage	Average hrs to take the practical test	Average cost of the practical test	Logbook Endorsement Costs	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost	
	a	b	c	d	e	f	$((a+b) \times 5/60 \text{ hours} \times c) + ((a+b) \times 5/60 \text{ hours} \times d)$	$(a \times c \times e) + (b \times c \times e)$	$(a \times f) + (b \times f)$			
2004	7,400	700	\$31.50	\$34.65	3	\$300	\$44,651	\$765,450	\$2,430,000	\$3,240,101	\$3,028,132	
2005	7,400	600	\$31.50	\$34.65	3	\$300	\$44,100	\$756,000	\$2,400,000	\$3,200,100	\$2,795,091	
2006	800	0	\$31.50	\$34.65	3	\$300	\$4,410	\$75,600	\$240,000	\$320,010	\$261,223	
2007	800	0	\$31.50	\$34.65	3	\$300	\$4,410	\$75,600	\$240,000	\$320,010	\$244,134	
2008	1,200	0	\$31.50	\$34.65	3	\$300	\$6,615	\$113,400	\$360,000	\$480,015	\$342,244	
2009	1,200	0	\$31.50	\$34.65	3	\$300	\$6,615	\$113,400	\$360,000	\$480,015	\$319,854	
2010	1,600	0	\$31.50	\$34.65	3	\$300	\$8,820	\$151,200	\$480,000	\$640,020	\$398,572	
2011	1,600	0	\$31.50	\$34.65	3	\$300	\$8,820	\$151,200	\$480,000	\$640,020	\$372,497	
2012	2,000	0	\$31.50	\$34.65	3	\$300	\$11,025	\$189,000	\$600,000	\$800,025	\$435,161	
2013	2,000	0	\$31.50	\$34.65	3	\$300	\$11,025	\$189,000	\$600,000	\$800,025	\$406,692	
2004-2013	26,000	1,300					\$150,491	\$2,579,850	\$8,190,000	\$10,920,341	\$8,603,602	

Source: U.S. Dept. of Trans., FAA, APO 310, May 2003

Table F.7 Cost of Retesting after Pilots or Instructors Fail the Practical Test																	
Year	# of existing pilots	# of new pilots	# of existing instructors	Pilot wage	Instructor Wage	Average hrs to take the practical test	Average cost of the practical test	Average hrs needed to reapply (form 8710-1)	Average hrs needed to retrain	Logbook Endorsement Costs	Cost of Reapplication (form 8710-1)	Cost of time to retrain	Cost of hiring instructors to retrain pilots	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost
	a ¹	a2	b	c	d	e	f ²	g	h	$\frac{((a1+a2+b) \times 5/60 \text{ hours} \times c)+((a1+a2+b) \times 5/60 \text{ hours} \times d)}{g}$	$\frac{((a1+a2) \times c \times g) + (b \times d \times g)}{g}$	$\frac{((a1+a2) \times c \times h) + (b \times d \times h)}{d \times h}$	$\frac{((a1+a2) \times d \times h) + (b \times d \times h)}{d \times h}$	$\frac{((a1+a2) \times c \times e) + (b \times d \times e)}{e}$	$\frac{((a1+a2) \times f) + (b \times f)}{f}$		
2004	700	40	70	\$31.50	\$34.65	2	\$200	0.25	1.00	\$4,465	\$6,434	\$25,736	\$28,067	\$51,471	\$162,000	\$278,172	\$259,974
2005	700	40	60	\$31.50	\$34.65	2	\$200	0.25	1.00	\$4,410	\$6,347	\$25,389	\$27,720	\$50,778	\$160,000	\$274,644	\$239,885
2006	0	80	0	\$31.50	\$34.65	2	\$200	0.25	1.00	\$441	\$630	\$2,520	\$2,772	\$5,040	\$16,000	\$27,403	\$22,369
2007	0	80	0	\$31.50	\$34.65	2	\$200	0.25	1.00	\$441	\$630	\$2,520	\$2,772	\$5,040	\$16,000	\$27,403	\$20,906
2008	0	120	0	\$31.50	\$34.65	2	\$200	0.25	1.00	\$662	\$945	\$3,780	\$4,158	\$7,560	\$24,000	\$41,105	\$29,307
2009	0	120	0	\$31.50	\$34.65	2	\$200	0.25	1.00	\$662	\$945	\$3,780	\$4,158	\$7,560	\$24,000	\$41,105	\$27,390
2010	0	160	0	\$31.50	\$34.65	2	\$200	0.25	1.00	\$882	\$1,260	\$5,040	\$5,544	\$10,080	\$32,000	\$54,806	\$34,130
2011	0	160	0	\$31.50	\$34.65	2	\$200	0.25	1.00	\$882	\$1,260	\$5,040	\$5,544	\$10,080	\$32,000	\$54,806	\$31,898
2012	0	200	0	\$31.50	\$34.65	2	\$200	0.25	1.00	\$1,103	\$1,575	\$6,300	\$6,930	\$12,600	\$40,000	\$68,508	\$37,264
2013	0	200	0	\$31.50	\$34.65	2	\$200	0.25	1.00	\$1,103	\$1,575	\$6,300	\$6,930	\$12,600	\$40,000	\$68,508	\$34,826
2004-2013	1,400	1,200	130							\$15,049	\$21,601	\$86,405	\$94,595	\$172,809	\$546,000	\$936,458	\$737,947
Source: U.S. Dept. of Trans, FAA, APO 310, May 2003																	
Notes:																	
1) The FAA assumes that approximately 10% of the pilots and instructors will fail the practical test.																	

Source: U.S. Dept. of Trans., FAA, APO 310, May 2003

Notes:

1) The FAA assumes that approximately 10% of the pilots and instructors will fail the practical test.

Cost to become certified as a flight instructor³

The candidate who is not an FAA certified instructor must receive and log ground training on the fundamentals of instruction and certain aeronautical knowledge areas. In addition, that candidate must have a commercial pilot license and be instrument rated before the candidate can become an instructor.

The flight instructor certificate must be renewed every 24 months in accordance with the provisions of § 61.197. If the certificate expires, the instructor must pass a practical test in order for the FAA to reinstate the privileges of the certificate. The cost of each of the required steps is estimated in the following paragraphs.

Ground Training Costs

Current rules require a flight instructor candidate to receive and log ground training on certain areas of operation. These instructor candidates need ground training to prepare for four knowledge tests. These knowledge tests are for commercial pilot license, instrument rating, and for an instructor's rating which requires two knowledge tests Fundamentals of Instruction (FOI) and Certified Flight Instructor (CFI)). The FAA estimates that the ground training time for the commercial pilot's license is 40 hours, for the instrument rating 40 hours, for the CFI test 40 hours, and for the FOI test 20 hours. Thus under current rules the FAA estimates that an instructor candidate would take 140 hours of ground training. Under current practice, instructor candidates going by association guidelines require only 10 hours of ground training for the instructor test. Thus, the difference between strictly enforcing the current rule, and current practice by FAA recognized ultralight organizations is 130 hours. We assume that instructor candidates will take four home study courses at an average cost of \$55.00 per course. This 130 hour differential is used in Table F.8. The table shows that ground training costs for new instructors equals \$10.4 million undiscounted and \$8.3 million discounted. These costs are estimated based on the assumption that all candidates take home study courses.

³ To calculate present value costs in the section we assume for estimation purposes that all training for instructors is completed in the year the instructors' start their license process. To the extent that some of the training is done in a prior year in the analysis period, our present value costs will be underestimates of true present value costs. The difference is though likely to be small.

Table F.8 Ground Training Cost for Instructors							
Year	# of new instructors	Study hours	Pilot wage	Cost of study time	Cost of the Courses	Undiscounted Cost	Discounted Cost
	a	b	c	$a \times b \times c$	$4 \times a \times \$55$		
2004	770	130	\$31.50	\$3,153,150	\$169,400	\$3,322,550	\$3,105,187
2005	670	130	\$31.50	\$2,743,650	\$147,400	\$2,891,050	\$2,525,155
2006	90	130	\$31.50	\$368,550	\$19,800	\$388,350	\$317,009
2007	90	130	\$31.50	\$368,550	\$19,800	\$388,350	\$296,270
2008	110	130	\$31.50	\$450,450	\$24,200	\$474,650	\$338,419
2009	110	130	\$31.50	\$450,450	\$24,200	\$474,650	\$316,279
2010	130	130	\$31.50	\$532,350	\$28,600	\$560,950	\$349,331
2011	130	130	\$31.50	\$532,350	\$28,600	\$560,950	\$326,478
2012	150	130	\$31.50	\$614,250	\$33,000	\$647,250	\$352,061
2013	150	130	\$31.50	\$614,250	\$33,000	\$647,250	\$329,029
2004-2013	2,400			\$9,828,000	\$528,000	\$10,356,000	\$8,255,219

Source: U.S. Dept. of Trans., FAA, APO 310, May 2003

Knowledge Test

A person applying for a flight instructor certificate must pass several knowledge tests. These are fundamentals or instructing, general flight instructor, commercial, and instrument knowledge tests. The time required to take these tests is on average 14 hours. Four hours each for the general commercial, instrument, and CFI tests, and two hours for the fundamentals of instruction test. Under current practice, the associations have two knowledge tests for potential sports pilot instructors. Two tests that constitute current practice are the CFI test and the fundamentals of instruction tests, which take on the average 6 hours to take. The difference between current rule and current practice is therefore 8 hours which is reflected in Tables F.13. Each test on the average costs \$90. The difference between current rule and current practice for the cost of the tests themselves is $\$90.00 \times 4 \text{ tests} - \$90.00 \times 2 \text{ tests} = \180.00 . Total costs sum to \$1 million undiscounted, \$826 thousand discounted (Table F.9).

We estimate 1/10 of the instructor candidates would fail one of the knowledge tests. These pilots would need to take that entire test over. Each test failed would require an extra hour to retrain. The difference between current rule and practice would be for two tests or 2 hours to retrain as well as the 8 hours to retake the failed knowledge tests. For those who fail the test and need to

be retested these costs total to \$119 thousand undiscounted, \$95 thousand undiscounted (Table F.10).

Table F. 9 Knowledge Test Costs								
Year	# of existing and new instructors	Student Instructor Wage	Average hrs to take the knowledge test	Average cost of the knowledge tests	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost
	a	b	c	d ¹	(a x b x c)	(a x d)		
2004	770	\$31.50	8	\$180.00	\$194,040	\$138,600	\$332,640	\$310,879
2005	670	\$31.50	8	\$180.00	\$168,840	\$120,600	\$289,440	\$252,808
2006	90	\$31.50	8	\$180.00	\$22,680	\$16,200	\$38,880	\$31,738
2007	90	\$31.50	8	\$180.00	\$22,680	\$16,200	\$38,880	\$29,661
2008	110	\$31.50	8	\$180.00	\$27,720	\$19,800	\$47,520	\$33,881
2009	110	\$31.50	8	\$180.00	\$27,720	\$19,800	\$47,520	\$31,665
2010	130	\$31.50	8	\$180.00	\$32,760	\$23,400	\$56,160	\$34,974
2011	130	\$31.50	8	\$180.00	\$32,760	\$23,400	\$56,160	\$32,686
2012	150	\$31.50	8	\$180.00	\$37,800	\$27,000	\$64,800	\$35,247
2013	150	\$31.50	8	\$180.00	\$37,800	\$27,000	\$64,800	\$32,941
2004-2013	2,400				\$604,800	\$432,000	\$1,036,800	\$826,479
Source: U.S. Dept. of Trans., FAA, APO 310, May 2003								
Source for the average cost to take the knowledge test:ASC								
Notes:								
1) According to ASC, the cost of the knowledge test is between \$65 and \$120 or \$92.50 [(65+120)/2] on average.								
We rounded it down to \$90 to avoid spurious accuracy.								

Table F.10 Cost of Retesting after Instructors Fail the Knowledge Test										
Year	# of existing and new instructors	Student instructor Wage	Average hrs to take the knowledge test	Average cost of the knowledge tests	Average hrs needed to retrain	Cost of time to retrain	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost
	a ¹	b	c	d ²	f	(a x b x f)	(a x b x c)	(a x d)		
2004	77	\$31.50	8	\$180.00	2.00	\$4,851	\$19,404	\$13,860	\$38,115	\$35,621
2005	67	\$31.50	8	\$180.00	2.00	\$4,221	\$16,884	\$12,060	\$33,165	\$28,968
2006	9	\$31.50	8	\$180.00	2.00	\$567	\$2,268	\$1,620	\$4,455	\$3,637
2007	9	\$31.50	8	\$180.00	2.00	\$567	\$2,268	\$1,620	\$4,455	\$3,399
2008	11	\$31.50	8	\$180.00	2.00	\$693	\$2,772	\$1,980	\$5,445	\$3,882
2009	11	\$31.50	8	\$180.00	2.00	\$693	\$2,772	\$1,980	\$5,445	\$3,628
2010	13	\$31.50	8	\$180.00	2.00	\$819	\$3,276	\$2,340	\$6,435	\$4,007
2011	13	\$31.50	8	\$180.00	2.00	\$819	\$3,276	\$2,340	\$6,435	\$3,745
2012	15	\$31.50	8	\$180.00	2.00	\$945	\$3,780	\$2,700	\$7,425	\$4,039
2013	15	\$31.50	8	\$180.00	2.00	\$945	\$3,780	\$2,700	\$7,425	\$3,774
2004-2013	240					\$15,120	\$60,480	\$43,200	\$118,800	\$94,701
Source: U.S. Dept. of Trans., FAA, APO 310, May 2003										
Source for the average cost to take the knowledge test:ASC										
Notes:										
1) The FAA assumes that approximately 10% of the pilots and instructors will fail the knowledge test.										
2) According to ASC, the cost of the knowledge test is between \$65 and \$120 or \$92.50 [(65+120)/2] on average. We rounded it down to \$90 to avoid spurious accuracy.										

Flight Training

The current rule requires instructor applicants receive flight training on specified areas of operation and that, before taking the required tests, the instructor who trained the applicant provide a logbook endorsement certifying the applicant is ready for the practical test. There are three types of tests the instructor candidates receive flight training for: commercial, instrument, and instructor. The FAA estimates that hours of flight training are respectively, 30, 25, and 20. Thus, under current regulations candidate instructors need on average 75 hours of flight training. Under current practice, the Associations recommend only 5 hours. The difference of 70 hours is the additional training needed by the candidate instructors. The 70 hour difference is reflected in Table F.11. The out of pocket costs (average cost of training) is computed by first multiplying the 70 hours by the average wage of a pilot instructor \$34.65, since there is an instructor and pilot in the training. This is multiplied by 2 since every hour of actual flight time is associated with an hour of ground time. Thus, out of pocket costs equal \$34.65 times 70 times 2 equals \$4,851. Table F.11 illustrates flight training costs for instructor applicants which are estimated to be \$22.2 million undiscounted or \$17.7 million discounted.

Table F.11 Flight Training Costs												
Year	# of new instructors	Average hrs spent in training	Average debriefing hrs	Average logbook hrs	Student Instructor Value of Time	Average cost of training	Cost of instructor time needed for training	Cost of time needed for debriefing	Cost of training	Logbook Endorsement Costs	Total Undiscounted Cost	Discounted Cost
	a ¹	b	c	d	e	f	(a x b x e)	(a x b x c x e)	(a x f)	a x b x d x e		
2004	770	70	0.92	0.08	\$31.50	\$4,851	\$1,697,850	\$1,556,363	\$3,735,270	\$141,488	\$7,130,970	\$6,664,458
2005	670	70	0.92	0.08	\$31.50	\$4,851	\$1,477,350	\$1,354,238	\$3,250,170	\$123,113	\$6,204,870	\$5,419,574
2006	90	70	0.92	0.08	\$31.50	\$4,851	\$198,450	\$181,913	\$436,590	\$16,538	\$833,490	\$680,376
2007	90	70	0.92	0.08	\$31.50	\$4,851	\$198,450	\$181,913	\$436,590	\$16,538	\$833,490	\$635,866
2008	110	70	0.92	0.08	\$31.50	\$4,851	\$242,550	\$222,338	\$533,610	\$20,213	\$1,018,710	\$726,326
2009	110	70	0.92	0.08	\$31.50	\$4,851	\$242,550	\$222,338	\$533,610	\$20,213	\$1,018,710	\$678,809
2010	130	70	0.92	0.08	\$31.50	\$4,851	\$286,650	\$262,763	\$630,630	\$23,888	\$1,203,930	\$749,747
2011	130	70	0.92	0.08	\$31.50	\$4,851	\$286,650	\$262,763	\$630,630	\$23,888	\$1,203,930	\$700,698
2012	150	70	0.92	0.08	\$31.50	\$4,851	\$330,750	\$303,188	\$727,650	\$27,563	\$1,389,150	\$755,606
2013	150	70	0.92	0.08	\$31.50	\$4,851	\$330,750	\$303,188	\$727,650	\$27,563	\$1,389,150	\$706,173
2004-2013	2,400						\$5,292,000	\$4,851,000	\$11,642,400	\$441,000	\$22,226,400	\$17,717,633
Source: U.S. Dept. of Trans., FAA, APO 310, May 2003												
Notes:												
1) The FAA assumes that 100% of new instructors will need flight training.												

Making Application to become an Instructor

Table F.12 illustrates the application cost for instructors. The FAA estimates that it would take 15 minutes per application and there are three applications instructors need to apply for: commercial, instrument, and instructor. Costs sum to \$187,000 or \$157,000 discounted.

Table F. 12 Cost of Applying to Become and Instructor							
Year	# of existing and new instructors	Instructor hours	DPE hours	Instructor wage	DPE Wage	Undiscounted Cost	Discounted Cost
2004	770	0.75	0.75	\$31.50	\$100.00	\$75,941	\$70,973
2005	670	0.75	0.75	\$31.50	\$100.00	\$66,079	\$57,716
2006	90	0.75	0.75	\$31.50	\$100.00	\$4,253	\$3,471
2007	90	0.75	0.75	\$31.50	\$100.00	\$4,253	\$3,244
2008	110	0.75	0.75	\$31.50	\$100.00	\$5,198	\$3,706
2009	110	0.75	0.75	\$31.50	\$100.00	\$5,198	\$3,463
2010	130	0.75	0.75	\$31.50	\$100.00	\$6,143	\$3,825
2011	130	0.75	0.75	\$31.50	\$100.00	\$6,143	\$3,575
2012	150	0.75	0.75	\$31.50	\$100.00	\$7,088	\$3,855
2013	150	0.75	0.75	\$31.50	\$100.00	\$7,088	\$3,603
2004-2013	2,400					\$187,380	\$157,432
Source: U.S. Dept. of Trans., FAA, APO 310, May 2003							
Notes:							
1) DPE woks with instructors on application.							
2) The FAA assumes that in the first two years DPEs will provide training for instructors.							

Practical Test

Under current rules, all flight instructors have to pass three practical tests. There are three practical tests to pass: commercial, instrument, and instructor. The practical, or flight, tests are given by a DPE. The FAA estimates the time to take each of these test on average is 4, 4, and 5 hours respectively or 13 hours in total. Under current practice, the associations only require 3 hours for one practical test. The difference of 10 hours is reflected in Table F.13 below. The Table shows the cost of the logbook endorsement the instructor must make before the test, the cost of the practical test, and the cost of instructor candidates' time to take the test. Total costs for practical test taking adds to \$3.2 million undiscounted or \$2.5 million discounted.

An estimated 10% who take the practical tests may fail it. Table F.14 estimates the cost of an additional training for the retest and the cost of reapplying to take the tests (completing FAA form 8710-1) after failure and the cost of taking the tests again. For the practical test the pilots who fail only need to retake the part of the test that they failed, not the entire test. Total cost for retesting of the practical tests is \$176,000 discounted, \$141,000 undiscounted.

Table F.13 Practical Test Costs										
Year	# of existing instructors	Student instructor value of time	DPE Wage	Average hrs to take the practical test	Average cost of the practical test	Logbook Endorsement Costs	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost
	a	b	c	d	e	(a x 5/60 hours x b)+(a x 5/60 hours x c)	(a x d x d)	a x g		
2004	770	\$31.50	\$100.00	10	\$1,000	\$8,438	\$242,550	\$770,000	\$1,020,988	\$954,194
2005	670	\$31.50	\$100.00	10	\$1,000	\$7,342	\$211,050	\$670,000	\$888,392	\$775,956
2006	90	\$31.50	\$100.00	10	\$1,000	\$986	\$28,350	\$90,000	\$119,336	\$97,414
2007	90	\$31.50	\$100.00	10	\$1,000	\$986	\$28,350	\$90,000	\$119,336	\$91,041
2008	110	\$31.50	\$100.00	10	\$1,000	\$1,205	\$34,650	\$110,000	\$145,855	\$103,993
2009	110	\$31.50	\$100.00	10	\$1,000	\$1,205	\$34,650	\$110,000	\$145,855	\$97,190
2010	130	\$31.50	\$100.00	10	\$1,000	\$1,425	\$40,950	\$130,000	\$172,375	\$107,346
2011	130	\$31.50	\$100.00	10	\$1,000	\$1,425	\$40,950	\$130,000	\$172,375	\$100,324
2012	150	\$31.50	\$100.00	10	\$1,000	\$1,644	\$47,250	\$150,000	\$198,894	\$108,185
2013	150	\$31.50	\$100.00	10	\$1,000	\$1,644	\$47,250	\$150,000	\$198,894	\$101,107
2004-2013	2,400					\$26,300	\$756,000	\$2,400,000	\$3,182,300	\$2,536,750
Source: U.S. Dept. of Trans., FAA, APO 310, May 2003										

Table F.14 Cost of Retesting after Pilots or Instructors Fail the Practical Test														
Year	# of existing and new instructors	Student instructor value of time	DPE Wage	Average hrs to take the practical test	Average cost of the practical test	Average hrs needed to reapply (form 8710-1)	Average hrs needed to retrain	Logbook Endorsement Costs	Cost of Reapplication (form 8710-1)	Cost of time to retrain	Cost of time to take the tests	Cost of the tests	Total Undiscounted Cost	Discounted Cost
	a ¹	b	c	d	e	f	g	(a x 5/60 hours x b)+(a x 5/60 hours x c)	(a x b x f)	(a x b x g)	(a x b x d)	(a x e)		
2004	77	\$31.50	\$100.00	5	\$500	0.25	2.00	\$844	\$606	\$4,851	\$12,128	\$38,500	\$56,929	\$53,204
2005	67	\$31.50	\$100.00	5	\$500	0.25	2.00	\$734	\$528	\$4,221	\$10,553	\$33,500	\$49,535	\$43,266
2006	9	\$31.50	\$100.00	5	\$500	0.25	2.00	\$99	\$71	\$567	\$1,418	\$4,500	\$6,654	\$5,432
2007	9	\$31.50	\$100.00	5	\$500	0.25	2.00	\$99	\$71	\$567	\$1,418	\$4,500	\$6,654	\$5,076
2008	11	\$31.50	\$100.00	5	\$500	0.25	2.00	\$121	\$87	\$693	\$1,733	\$5,500	\$8,133	\$5,798
2009	11	\$31.50	\$100.00	5	\$500	0.25	2.00	\$121	\$87	\$693	\$1,733	\$5,500	\$8,133	\$5,419
2010	13	\$31.50	\$100.00	5	\$500	0.25	2.00	\$142	\$102	\$819	\$2,048	\$6,500	\$9,611	\$5,985
2011	13	\$31.50	\$100.00	5	\$500	0.25	2.00	\$142	\$102	\$819	\$2,048	\$6,500	\$9,611	\$5,594
2012	15	\$31.50	\$100.00	5	\$500	0.25	2.00	\$164	\$118	\$945	\$2,363	\$7,500	\$10,145	\$5,518
2013	15	\$31.50	\$100.00	5	\$500	0.25	2.00	\$164	\$118	\$945	\$2,363	\$7,500	\$11,090	\$5,638
2004-2013	240							\$2,630	\$1,890	\$15,120	\$37,800	\$120,000	\$176,495	\$140,931

Source: U.S. Dept. of Trans., FAA, APO 310, May 2003

F.3. Maintenance Provisions

Maintenance requirements if strictly enforced would also lead to an increase in costs over current practice. Aircraft inspections must be done once a year and after every 100 hours of flight time. This provision will apply to the ultralight like aircraft as well. Each inspection is assumed to be done at a repair station at an average costs \$275. The FAA estimates that this provision will affect 15,300 existing aircraft and an additional 12,000 new aircraft over 10 years. There will be 200,650 inspections over the period of analysis. Over the 10 years, these costs will be approximately \$53.7 million (\$35.9 million, discounted), as shown in Table F.15.

Table F.15 Cost of Aircraft Inspections						
Year	Existing pilots	Existing instructors	New pilots	# of aircraft inspections	Total Undiscounted Cost	Total Discounted Cost
	a	b	c			
2004	7,000	700	400	8,100	\$2,227,500	\$2,081,776
2005	7,000	600	400	16,100	\$4,427,500	\$3,867,150
2006			800	16,900	\$4,647,500	\$3,793,744
2007			800	17,700	\$4,867,500	\$3,713,392
2008			1,200	18,900	\$5,197,500	\$3,705,746
2009			1,200	20,100	\$5,527,500	\$3,683,207
2010			1,600	21,700	\$5,967,500	\$3,716,259
2011			1,600	23,300	\$6,407,500	\$3,729,223
2012			2,000	25,300	\$6,957,500	\$3,784,419
2013			2,000	27,300	\$7,507,500	\$3,816,432
	14,000	1,300	12,000	195,400	\$53,735,000	\$35,891,349

Source: U.S. Dept. of Trans., FAA, APO 310, May 2003

XV. Appendix G. Individual Costs

Existing Instructors

An existing instructor will incur the following out-of-pocket costs:

- \$350 for a LSA airworthiness certification inspection of their existing aircraft and \$350 for their next new aircraft;
- from \$1,875 to \$7,642⁶³ in additional costs when they purchase their next aircraft;
- \$5 to obtain an identification number for its existing aircraft and \$5 to obtain an identification number for its new aircraft;
- \$50 to display aircraft marks for its existing aircraft and \$50 to display aircraft marks for its new aircraft;
- \$90 for the instructor knowledge test;
- \$4 to provide the FAA a certified copy of ultralight pilot records;
- \$100 to buy training courses;
- \$25 for applying to become an instructor;
- \$308 for the instructor practical test; and
- from \$2,000 to \$3,000 in repairmen classes or \$300 per year to have their aircraft inspected by a certified mechanic.

From 2004 to 2013, the total out-of-pocket cost of the rule for an existing instructor who takes a repairman class will range from \$6,212 to \$11,979 and for an existing instructor who has her aircraft inspected by a certified mechanic, it will range from \$5,612 to \$11,379.

Existing instructors not only have to incur out-of-pocket costs, they also have to spend time complying with these requirements. The estimated time cost includes the following:

- \$26 to obtain an identification number for its existing aircraft and \$26 to obtain an identification number for its new aircraft;
- \$26 to register its aircraft;
- \$35 to return form 8050-3 for its existing aircraft and \$35 to return form 8050-3 for its new aircraft;

⁶³ \$7,642 = \$1,875 + \$5,767. These aircraft costs depend on whether or not instructors are forced to replace their aircraft sooner than they would have been voluntarily retired and when instructors decide to buy their aircraft.

- \$69 for the instructor knowledge test;
- \$6 to provide the FAA a certified copy of ultralight pilot records;
- \$9 for applying to become an instructor;
- \$107 for the instructor practical test;
- \$4,158 in repairmen classes;
- \$6 to submit form 8610-2; and
- \$3 for a logbook endorsement.

From 2004 to 2013, the total time cost of the rule for an existing instructor who takes a repairman class will range from \$4,445 to \$4,532 and for an existing instructor who has her aircraft inspected by a certified mechanic will range from \$278 to \$365.

Therefore, from 2004 to 2013, the total cost of the rule for an existing instructor who takes a repairman class will range from \$10,744 to \$16,511 (from \$9,517 to \$13,628, discounted) and annualized costs range from \$1,356 to \$1,940. From 2004 to 2013, the total cost of the rule for an existing instructor who has her aircraft inspected by a certified mechanic will range from \$5,977 to \$11,744 (from \$4,431 to \$8,543, discounted) and annualized costs⁶⁴ range from \$631 to \$1,216.

New Instructors

A new instructor will incur the following out-of-pocket costs:

- \$350 for a LSA airworthiness certification inspection of their new aircraft;
- from \$1,607 to \$2,344 in additional costs when they purchase new aircraft;
- \$50 to display aircraft marks;
- \$690 in additional instructor flight training;
- \$100 to buy training courses;
- \$25 for applying to become an instructor; and
- from \$2,000 to \$3,000 in repairmen classes or \$300 per year to have their aircraft inspected at a repair shop.

⁶⁴ These costs were annualized using a capital recovery factor of 0.14238, over 10 years, using a 7 percent rate of interest

From 2004 to 2013, the total out-of-pocket cost of the rule for a new instructor who takes a repairman class will range from \$5,822 to \$6,559 and for a new instructor who has her aircraft inspected by a certified mechanic, it will range from \$5,522 to \$6,259.

New instructors have to spend time complying with these requirements. The estimated time cost includes the following:

- \$26 to register its aircraft;
- \$630 in instructor flight training;
- \$8 for applying to become an instructor;
- from \$2,772 to \$4,158 in repairmen classes;
- \$6 to submit form 8610-2; and
- \$3 for a logbook endorsement.

From 2004 to 2013, the total time cost for a new instructor who takes a repairman class will be \$4,831 and for a new instructor who has her aircraft inspected by a certified mechanic, it will be \$664.

Therefore, from 2004 to 2013, the total cost of the rule for a new instructor who takes a repairman class will range from \$10,653 to \$11,390 (from \$9,956 to \$10,645, discounted) and annualized costs range from \$1,418 to \$1,516. From 2004 to 2013, the total cost of the rule for a new instructor who has her aircraft inspected by a certified mechanic will range from \$6,186 to \$6,923 (from \$5,085 to \$5,773, discounted) and annualized costs range from \$724 to \$822.

Existing Pilots who are Trade Organization Members

An existing pilot who is a trade organization member will incur the following out-of-pocket costs:

- \$350 for a LSA airworthiness certification inspection of their existing aircraft and \$350 for their next new aircraft;
- from \$1,425 to \$2,344 in additional costs when they purchase their next aircraft;
- \$5 to obtain an identification number for its aircraft;
- \$50 to display aircraft marks;

- \$93 for the pilot knowledge test;
- \$4 to provide the FAA a certified copy of ultralight pilot records;
- \$17 to apply to become a sport pilot;
- \$203 for the pilot practical test; and
- from \$500 to \$3,000 in repairmen classes or \$275 per year to have their aircraft inspected at a repair shop (totaling \$2,750 over 10 years).

Additionally an existing pilot who is a trade organization member will incur a cost of:

- \$200 for a biennial flight review done four times, totaling \$800 over 10 years, and
- a biennial cost of \$3 for a BFR logbook endorsement, costing \$12 over 10 years.

From 2004 to 2013, the total out-of-pocket cost of the rule for an existing pilot who is a trade organization member and takes a repairman class will range from \$3,809⁶⁵ to \$7,228⁶⁶ (from \$3,348 to \$6,544, discounted) and annualized costs range from \$477 to \$932. From 2004 to 2013, the total out-of-pocket cost of the rule for an existing pilot who is a trade organization member and has her aircraft inspected by a certified mechanic will be \$6,059⁶⁷ (\$4,812, discounted) and annualized costs will be \$685.

Existing pilots who are trade organization members not only have to incur out-of-pocket costs, they also have to spend time complying with these requirements. The estimated time cost includes the following:

- \$24 to obtain an identification number for its aircraft;
- \$24 to register its aircraft;
- \$66 for the pilot knowledge test;
- \$5 to provide the FAA a certified copy of ultralight pilot records;
- \$8 for applying to become a pilot;
- \$66 for the pilot practical test;
- from \$504 to \$3,780 in repairmen classes;
- \$6 to submit form 8610-2; and

⁶⁵ \$350 + \$350 + \$1,425 + \$5 + \$50 + \$93 + \$4 + \$17 + \$203 + \$500 + \$800 + \$12.

⁶⁶ \$350 + \$350 + \$2,344 + \$5 + \$50 + \$93 + \$4 + \$17 + \$203 + \$3,000 + \$800 + \$12.

⁶⁷ \$350 + \$350 + \$1,425 + \$5 + \$50 + \$93 + \$4 + \$17 + \$203 + \$2,750 + \$800 + \$12.

- \$3 for a logbook endorsement.

Additionally an existing pilot who is a trade organization member will incur a cost of:

- \$63 for a biennial flight review done four times, totaling \$252 over 10 years, and
- a biennial cost of \$12 for a BFR logbook endorsement, costing \$12 over 10 years.

From 2004 to 2013, the total time cost of the rule for an existing pilot who is a trade organization member will range from \$970⁶⁸ to \$4,246⁶⁹ (from \$838 to \$3,899, discounted) and annualized time costs range from \$119 to \$555.

Therefore, from 2004 to 2013, the total cost of the rule for an existing pilot who is a trade organization member and takes a repairman class will range from \$4,779 to \$11,474 (from \$4,186 to \$10,443, discounted) and annualized costs range from \$596 to \$1,487. From 2004 to 2013, the total cost of the rule for an existing instructor who is a trade organization member and has her aircraft inspected by a certified mechanic will be \$7,029 (\$5,650, discounted) and annualized costs will be \$804.

New Pilots or Existing Pilots who are not Trade Organization Members

A new pilot or an existing pilot who is not a trade organization member will incur the following out-of-pocket costs:

- \$650 for a LSA airworthiness certification inspection of their new aircraft;
- from \$1,425 to \$2,344 in additional costs when they purchase new aircraft;
- \$5 to obtain an identification number for its aircraft;
- \$50 to display aircraft marks;
- \$72 for ground training;
- \$93 for the pilot knowledge test;
- \$2,190 in flight training costs;
- \$26 to apply to become a sport pilot;
- \$203 for the pilot practical test; and

⁶⁸ \$24 + \$24 + \$66 + \$5 + \$8 + \$66 + \$504 + \$6 + \$3 + \$264.

⁶⁹ \$24 + \$24 + \$66 + \$5 + \$8 + \$66 + \$3,780 + \$6 + \$3 + \$264.

- from \$500 to \$3,000 in repairmen classes or \$275 per year to have their aircraft inspected at a repair shop (totaling \$2,750 over 10 years).

Additionally a new pilot or an existing pilot who is not a trade organization member will incur a cost of:

- \$200 for a biennial flight review done four times, totaling \$800 over 10 years, and
- a biennial cost of \$3 for a BFR logbook endorsement, costing \$12 over 10 years.

From 2004 to 2013, the total out-of-pocket cost of the rule for a new pilot or an existing pilot who is not a trade organization member and takes a repairman class will range from \$6,026⁷⁰ to \$9,445⁷¹ (from \$5,420 to \$8,616, discounted) and annualized costs range from \$772 to \$1,227.

From 2004 to 2013, the total out-of-pocket cost of the rule for a new pilot or an existing pilot who is not a trade organization member and has her aircraft inspected by a certified mechanic will be \$8,276⁷² (\$6,884, discounted) and annualized costs will be \$980.

New pilots and existing pilots who are not trade organization members not only have to incur out-of-pocket costs, they also have to spend time complying with these requirements. The estimated time cost includes the following:

- \$24 to obtain an identification number for its aircraft;
- \$24 to register its aircraft;
- \$945 for ground training;
- \$66 for the pilot knowledge test;
- \$1,260 in flight training costs;
- \$13 for applying to become a sport pilot;
- \$66 for the pilot practical test;
- from \$504 to \$3,780 in repairmen classes;
- \$5 to submit form 8610-2; and
- \$3 for a logbook endorsement.

⁷⁰ \$650 + \$1,425 + \$5 + \$50 + \$72 + \$93 + \$2,190 + \$26 + \$203 + \$500 + \$800 + \$12.

⁷¹ \$650 + \$2,344 + \$5 + \$50 + \$72 + \$93 + \$2,190 + \$26 + \$203 + \$3,000 + \$800 + \$12.

⁷² \$650 + \$1,425 + \$5 + \$50 + \$72 + \$93 + \$2,190 + \$26 + \$203 + \$2,750 + \$800 + \$12.

Additionally a new pilot or an existing pilot who is not a trade organization member will incur a cost of:

- \$63 for a biennial flight review done four times, totaling \$252 over 10 years, and
- a biennial cost of \$12 for a BFR logbook endorsement, costing \$12 over 10 years.

From 2004 to 2013, the total value of time cost of the rule for a new pilot or an existing pilot who is not a trade organization member will range from \$3,174⁷³ to \$6,450⁷⁴ (from \$2,898 to \$5,959, discounted) and annualized time costs range from \$413 to \$848.

Therefore, from 2004 to 2013, the total cost of the rule for a new pilot or an existing pilot who is not a trade organization member and takes a repairman class will range from \$9,200 to \$15,895 (from \$8,318 to \$14,575, discounted) and annualized costs range from \$1,184 to \$2,075. From 2004 to 2013, the total cost of the rule for a new pilot or an existing pilot who is not a trade organization member and has her aircraft inspected by a certified mechanic will be \$11,450 (\$9,782, discounted) and annualized costs will be \$1,393.

⁷³ \$24 + \$24 + \$945 + \$66 + \$1,260 + \$13 + \$66 + \$504 + \$5 + \$3 + \$264.

⁷⁴ \$24 + \$24 + \$945 + \$66 + \$1,260 + \$13 + \$66 + \$3,780 + \$5 + \$3 + \$264.

Table G.1 Individual Costs for Existing Instructors (2004-2013)	Out-of-pocket Costs	Value of time Cost	Total Cost	Frequency
Table 1. Cost of Light-Sport Aircraft Airworthiness Certification Inspections	\$350	\$0	\$350	one time cost
Table 2A. Cost of Consensus Standards				
Existing instructors and new instructors who buy factory-built aircraft				
2004-2006	\$2,344	\$0	\$2,344	one time cost
2007-2009	\$1,875	\$0	\$1,875	one time cost
Cost of replacing an aircraft before it would have been retired (existing instructors)				
2008	\$5,767	\$0	\$5,767	one time cost
Table 4. Cost of Obtaining Identification number for: Aircraft not previously Registered, Aircraft Previously Registered in the U.S., Aircraft Previously Registered in a Foreign Country	\$5	\$26	\$31	one time cost
Table 5. Time Cost of Registering Aircraft not Previously Registered Anywhere, Aircraft previously in the U.S., A/C previously registered in foreign countries	\$0	\$26	\$26	one time cost
Table 6. Cost of Returning Form 8050-3	\$0	\$35	\$35	one time cost
Table 8. Cost to Display Aircraft Marks	\$50	\$0	\$50	one time cost
Table 20. Knowledge Test Costs	\$90	\$69	\$159	one time cost
Table 22. Cost to Provide the FAA a Certified Copy of Ultralight Pilot Records (61.453 d)	\$4	\$6	\$10	one time cost
Table 24. Cost of Buying the Training Course from Associations	\$100	\$0	\$100	one time cost
Table 25. Cost of Applying to Become an Instructor	\$25	\$9	\$34	one time cost
Table 26. Practical Test Costs	\$308	\$107	\$415	one time cost
Table 29. Cost of Inspections at a Repair Shop	\$300	\$0	\$300	annually
Table 31. Cost of Obtaining a Repairmen Certificate with a Maintenance Rating				
Airplane: existing instructors	\$3,000	\$4,158	\$7,158	one time cost
Lighter than air or glider: existing instructors	\$2,000	\$2,772	\$4,772	one time cost
Weight shift control or powered parachute: existing instructors	\$2,600	\$3,604	\$6,204	one time cost
Table 32. Cost of Submitting Form 8610-2	\$0	\$6	\$6	one time cost
Table 33. Cost of Logbook Endorsement	\$0	\$3	\$3	one time cost

Table G.2 Individual Costs for New Instructors (2004-2013)	Out-of-pocket Costs	Value of time Cost	Total Cost	Frequency
Table 1. Cost of Light-Sport Aircraft Airworthiness Certification Inspections	\$350	\$0	\$350	one time cost
Table 2A. Cost of Consensus Standards				
Existing instructors and new instructors who buy factory-built aircraft				
2004-2006	\$2,344	\$0	\$2,344	one time cost
2007-2009	\$1,875	\$0	\$1,875	one time cost
2010-2013	\$1,607	\$0	\$1,607	one time cost
Table 5. Time Cost of Registering Aircraft not Previously Registered Anywhere, Aircraft previously in the U.S., A/C previously registered in foreign countries	\$0	\$26	\$26	one time cost
Table 8. Cost to Display Aircraft Marks	\$50	\$0	\$50	one time cost
Table 23. Flight Training Costs-New Instructors	\$690	\$630	\$1,320	one time cost
Table 24. Cost of Buying the Training Course from Associations	\$100	\$0	\$100	one time cost
Table 25. Cost of Applying to Become an Instructor	\$25	\$8	\$33	one time cost
Table 29. Cost of Inspections at a Repair Shop	\$300	\$0	\$300	annually
Table 31. Cost of Obtaining a Repairmen Certificate with a Maintenance Rating				
Airplane: existing instructors and new instructors	\$3,000	\$4,158	\$7,158	one time cost
Ligher than air or glider: existing instructors and new instructors	\$2,000	\$2,772	\$4,772	one time cost
Weight shift control or powered parachute: existing instructors and new instructors	\$2,600	\$3,604	\$6,204	one time cost
Table 32. Cost of Submitting Form 8610-2	\$0	\$6	\$6	one time cost
Table 33. Cost of Logbook Endorsement	\$0	\$3	\$3	one time cost

Table G.3 Individual Costs for Existing Pilots who are Trade Organization Members (2004-2013)	Out-of-pocket Costs	Value of time Cost	Total Cost	Frequency
Table 1. Cost of Light-Sport Aircraft Airworthiness Certification Inspections	\$350	\$0	\$350	one time cost
Table 2A. Cost of Consensus Standards				
Existing pilots and new pilots who buy kit-built aircraft				
2004-2006	\$2,078	\$0	\$2,078	one time cost
2007-2009	\$1,663	\$0	\$1,663	one time cost
2010-2013	\$1,425	\$0	\$1,425	one time cost
Existing pilots and new pilots who buy factory-built aircraft				
2004-2006	\$2,344	\$0	\$2,344	one time cost
2007-2009	\$1,875	\$0	\$1,875	one time cost
2010-2013	\$1,607	\$0	\$1,607	one time cost
Table 4. Cost of Obtaining Identification number for: Aircraft not previously Registered, Aircraft Previously Registered in the U.S., Aircraft Previously Registered in a Foreign Country	\$5	\$24	\$29	one time cost
Table 5. Time Cost of Registering Aircraft not Previously Registered Anywhere, Aircraft previously in the U.S., A/C previously registered in foreign countries	\$0	\$24	\$24	one time cost
Table 8. Cost to Display Aircraft Marks	\$50	\$0	\$50	one time cost
Table 10. Knowledge Test Costs	\$93	\$66	\$159	one time cost
Table 12. Cost to Provide the FAA a Certified Copy of Ultralight Pilot Records	\$4	\$5	\$9	one time cost
Table 14. Cost of Applying to become a Sport Pilot (Form 8710-1)	\$17	\$8	\$25	one time cost
Table 15. Practical Test Costs	\$203	\$66	\$269	one time cost
Table 17. Biennial Flight Review Costs	\$200	\$63	\$263	every 2 years
Table 18. Cost of BFR Logbook Endorsements	\$3	\$3	\$6	every 2 years
Table 29. Cost of Inspections at a Repair Shop	\$275	\$0	\$275	annually
Table 30. Cost of Inspection Repairmen Obtaining a Repairmen certificate with an Inspection Rating	\$500	\$504	\$1,004	one time cost
Table 31. Cost of Obtaining a Repairmen Certificate with a Maintenance Rating				
Airplane: existing pilots	\$3,000	\$3,780	\$6,780	one time cost
Lighter than air or glider: existing pilots	\$2,000	\$2,520	\$4,520	one time cost
Weight shift control or powered parachute: existing pilots	\$2,600	\$3,276	\$5,876	one time cost
Table 32. Cost of Submitting Form 8610-2	\$0	\$5	\$5	one time cost
Table 33. Cost of Logbook Endorsement	\$0	\$3	\$3	one time cost

Table G.4 Individual Costs for New Pilots or Existing Pilots who are not Trade Organization Members (2004-2013)	Out-of-pocket Costs	Value of time Cost	Total Cost	Frequency
Table 1. Cost of Light-Sport Aircraft Airworthiness Certification Inspections	\$650	\$0	\$650	one time cost
Table 2A. Cost of Consensus Standards				
Existing pilots and new pilots who buy kit-built aircraft				
2004-2006	\$2,078	\$0	\$2,078	one time cost
2007-2009	\$1,663	\$0	\$1,663	one time cost
2010-2013	\$1,425	\$0	\$1,425	one time cost
Existing pilots and new pilots who buy factory-built aircraft				
2004-2006	\$2,344	\$0	\$2,344	one time cost
2007-2009	\$1,875	\$0	\$1,875	one time cost
2010-2013	\$1,607	\$0	\$1,607	one time cost
Table 4. Cost of Obtaining Identification number for: Aircraft not previously Registered, Aircraft Previously Registered in the U.S., Aircraft Previously Registered in a Foreign Country	\$5	\$24	\$29	one time cost
Table 5. Time Cost of Registering Aircraft not Previously Registered Anywhere, Aircraft previously in the U.S., A/C previously registered in foreign countries	\$0	\$24	\$24	one time cost
Table 8. Cost to Display Aircraft Marks	\$50	\$0	\$50	one time cost
Table 9. Ground Training Costs	\$72	\$945	\$1,017	one time cost
Table 10. Knowledge Test Costs	\$93	\$66	\$159	one time cost
Table 13A. Flight Training Costs of Pilots not with Associations	\$2,190	\$1,260	\$3,450	one time cost
Table 14. Cost of Applying to become a Sport Pilot (Form 8710-1)	\$26	\$13	\$39	one time cost
Table 15. Practical Test Costs	\$203	\$66	\$269	one time cost
Table 17. Biennial Flight Review Costs	\$200	\$63	\$263	every 2 years
Table 18. Cost of BFR Logbook Endorsements	\$3	\$3	\$6	every 2 years
Table 29. Cost of Inspections at a Repair Shop	\$275	\$0	\$275	annually
Table 30. Cost of Inspection Repairmen Obtaining a Repairmen certificate with an Inspection Rating	\$500	\$504	\$1,004	one time cost
Table 31. Cost of Obtaining a Repairmen Certificate with a Maintenance Rating				
Airplane: existing pilots and new pilots	\$3,000	\$3,780	\$6,780	one time cost
Lighter than air or glider: existing pilots and new pilots	\$2,000	\$2,520	\$4,520	one time cost
Weight shift control or powered parachute: existing pilots and new pilots	\$2,600	\$3,276	\$5,876	one time cost
Table 32. Cost of Submitting Form 8610-2	\$0	\$5	\$5	one time cost
Table 33. Cost of Logbook Endorsement	\$0	\$3	\$3	one time cost

Appendix H - Cost Comparison Between NPRM Regulatory Evaluation and Final Rule Regulatory Evaluation

The Regulatory Evaluation for the NPRM estimated that the proposed sport pilot rule would impose an estimated compliance cost of \$40.3 million (\$33.9 million, discounted) in 1999 dollars over ten years. The Regulatory Evaluation for the Final Rule estimates that the sport pilot rule will impose an estimated \$221.0 million (\$158.4 million discounted) in compliance costs.

Table H.1 Comparison of Total Costs (2004 2013) - NPRM with Final Rule	Final Rule Total Undiscounted Costs	Final Rule Total Discounted Cost	Final Rule Out- of-Pocket Cost Undiscounted	NPRM ¹ Cost Undiscounted	Difference between Final Rule Total Cost and NPRM (Undiscounted)	Difference between Final Rule Total Cost and NPRM (Discounted)	Difference between Final Rule Out-of- Pocket and NPRM (Undiscounted)	Final Rule Out- of-Pocket Discounted	NPRM ¹ Cost Discounted	Difference between Final Rule Out-of- Pocket and NPRM Discounted
Cost of Aircraft Inspection, certification, and Registration	\$65,225,588	\$46,642,019	\$63,203,639	\$13,878,000	\$51,347,588	\$34,890,487	\$49,325,639	\$45,108,437	\$11,751,532	\$33,356,905
Costs for Training, Testing, and Registering Sport Pilots	\$70,490,197	\$51,445,667	\$37,938,298					\$27,624,173		
Costs for Training, Testing, and Registering Instructors with A Sport Pilot Rating	\$3,088,700	\$2,310,446	\$1,558,143					\$1,205,164		
Total Training Costs for Sport Pilots and PI with SP Rating	\$73,578,897	\$53,756,112	\$39,496,441	\$9,808,113	\$63,770,784	\$45,999,438	\$29,688,328	\$28,829,337	\$7,756,674	\$21,072,663
Ground Instructor Costs	\$1,176,210	\$826,121	\$0							
Maintenance Costs	\$62,118,520	\$43,304,927	\$36,836,558	\$16,651,300	\$45,467,220	\$28,927,732	\$20,185,258	\$24,915,704	\$14,377,195	\$10,538,509
Total Private Sector Costs	\$202,099,215	\$144,529,179	\$139,536,638	\$40,337,413	\$160,585,592	\$109,817,657	\$99,199,225	\$98,853,479	\$33,885,401	\$64,968,078
Aircraft Certification Costs	\$3,965,729	\$3,090,040	\$3,965,729	not estimated				\$3,090,040		
Pilot and Instructor Qualification Costs	\$384,187	\$316,170	\$384,187	not estimated				\$316,170		
Maintenance Provisions Costs	\$454,833	\$372,461	\$454,833	not estimated				\$372,461		
Light-Sport Program Office	\$13,623,264	\$9,777,605	\$13,623,264	not estimated				\$9,777,605		
Miscellaneous Costs	\$475,159	\$322,129	\$475,159	not estimated				\$322,129		
Total Government Costs	\$18,903,172	\$13,878,405	\$18,903,172					\$13,878,405		
Total Costs	\$221,002,387	\$158,407,584	\$158,439,810	\$40,337,413	\$160,585,592	\$109,817,657	\$99,199,225	\$112,731,884	\$33,885,401	\$64,968,078
Source: U.S. Dept. of Trans., FAA, APO 310, November 2003										
1) NPRM Costs are all out-of-pocket										

Table H.1 compares the estimated costs derived during the final rule analysis and those derived during the NPRM analysis. The total difference in estimated costs between the two analyses is \$180.7 million (\$124.5 million discounted). Part of the difference can be accounted for by government costs and time costs which were estimated in the final rule analysis but not in the NPRM analysis. The final rule analysis estimated government costs of \$18.9 million (\$13.9 million discounted) and time costs of \$62.6 million (\$45.7 million discounted). The total of government and time costs accounts for \$81.5 million (\$59.6 million discounted) of the difference between the final rule and the NPRM analyses.

Without including government costs or time costs the final rule is estimated to cost \$139.5 million (\$98.9 million). This leaves a difference of \$99.2 million (\$65.0 million discounted) between costs estimated by the final rule analysis and the NPRM analysis. The following paragraphs address some of the major differences between the NPRM and final rule analyses.

Aircraft inspection, certification, and registration

As indicated in Table H.1, the final rule estimated \$63.2 million (\$45.1 million discounted) out-of-pocket costs would be incurred by the private sector in complying with the aircraft inspection, certification and registration requirements. The NPRM estimated these costs at \$13.9 million (\$11.8 million). These differences may be accounted for by differences assumed in number of aircraft that would be certified, registered, and produced under the consensus standards and differences in the estimated cost of the consensus standards between the two analyses.

- The NPRM assumed that 9,000 existing vehicles would be certified for sport pilot use and that 1,000 existing vehicles would be certified for flight instructor use; but the final rule assumed that 13,600 existing vehicles would be certified for sport pilot use and 1,170 existing vehicles would be certified for flight instructor use either because they would have to be certified or replaced;
- The NPRM assumed a total of 8,140 new aircraft would be purchased over the ten year period and that 925 new flight instructor aircraft would be purchased; but the final rule assumed that 12,000 new light-sport aircraft would be purchased and that 1,100 new flight instructor aircraft would be purchased.
- The NPRM did not assume that any aircraft would be replaced while the final rule assumed that ten percent of existing pilot owned aircraft would be replaced every year with new aircraft produced to consensus standards and certified. The total aircraft that the final rule assumed would be purchased to replace existing pilot owned aircraft was 15,300 over ten years.

- The NPRM did not include any cost that instructors would incur by being required to replace their vehicles after three years in order to be allowed to continue to instruct; but the final rule estimated that it would cost instructors \$2.3 million to replace 650 aircraft one to five years sooner than they would have without the rule.
- The NPRM did not include the cost of displaying aircraft marks on each aircraft; while the final rule included costs of \$946,000 to display aircraft marks on each vehicle.
- The NPRM assumed that to comply with the consensus standards from scratch would cost an estimated \$3,500 per aircraft but that 80% of manufacturers were already in compliance; while the final rule assumed that complying with the consensus standards would cause one-third of aircraft to be priced 15% higher than they are currently, another third 12% higher than they are currently and the remainder 8% higher than currently priced for the first three years after the rule. The estimated incremental cost went down in later years because of the learning curve. In the 2nd three years, one-third of new aircraft would be priced 12% higher because of the rule, and two-thirds would be priced 8% higher. In the final four years of the analysis, all new aircraft were assumed to be priced 8% higher. The estimates used in the NPRM give an average incremental cost of \$700 per new aircraft over the ten year period while the estimate used in the final rule result an average incremental cost per aircraft of \$1,410 over the ten year period.

Training, Testing and Registration of Sport Pilots and Instructors of Sport Pilots

The final rule estimated that out of pocket costs of \$37.9 million (\$27.6 million discounted) would be incurred by the private sector because of the requirements for training, testing and registration of sport pilots and instructors of sport pilots. The NPRM estimated that the private sector would incur costs of \$9.8 million (\$7.8 million discounted) because of these requirements. These differences may be accounted for by differences assumed in the number of sport pilots and flight instructors, differences in the cost of obtaining a sport pilot or flight instructor certificate, differences in what costs were included in the analysis.

- The NPRM assumed that 9,000 existing individuals would seek sport pilot certificates and that 1,000 instructors would seek flight instructor certificates; but the final rule assumed that 14,000 existing pilots would seek sport pilot certificates and that 1,300 existing instructors would seek flight instructor certificates.
- The NPRM assumed that 8,140 new pilots would seek sport pilot certificates and that 925 new instructors would seek flight instructor certificates; while the final rule assumed that 12,000 new pilots would seek sport pilot certificates and 1,100 new instructors would seek flight instructor certificates.
- The NPRM estimated that individuals seeking sport pilot certificates would incur costs of \$150 each if they received credit for experience, and \$750 each if they did not receive credit for experience. It is not indicated what specific costs are included in these estimates. The final rule estimated that existing pilots who are trade organization members would incur \$317 in costs including the cost of the knowledge and practical test, application costs and cost to provide certification of pilot records. The final rule estimated that new or existing pilots who are not trade organization members would incur \$2,584 in costs including the cost of ground and flight training, the knowledge and practical test, and application costs.
- The NPRM estimated that those seeking flight instructor certificates would incur costs of \$250 if they receive credit for experience and \$1,400 if they do not receive credit for experience. The final rule estimated that flight instructors⁷⁵ who are currently instructors with trade organizations would incur costs of \$527 which includes the cost of the knowledge and practical tests, application and certification of pilot records, and training courses. The final rule estimated that new flight instructors would incur costs of \$815 including the cost of the knowledge test, additional flight instructor training and application fees.

⁷⁵ All existing flight instructors were assumed to be ultralight flight instructors with trade organizations.

- The NPRM estimated that the cost of a biennial flight review would be \$50, while the final rule estimated that the cost of a biennial flight review would be \$100.

Costs of Maintenance Provisions

The final rule analysis estimated that \$36.8 million (\$24.9 million discounted) out-of-pocket costs would be incurred by the private sector in complying with the maintenance provisions of the rule including the requirements to train in order to perform maintenance inspections on light-sport aircraft or to have these inspections performed by appropriately qualified repairmen. The NPRM analysis estimated these costs to be \$16.7 million (\$14.4 million discounted). These differences may be accounted for by increases in the number of airmen receiving training and increases in the estimated cost of taking an aircraft to an appropriately trained repairman.

- The NPRM estimated that 17,155 individuals would train to become certified as repairman with an inspection rating at a cost of \$720 each incurring a total cost of \$12.4 million; while the final rule estimated that 19,800 would become certified at a cost of \$500 each for a total cost of \$9.9 million.
- The NPRM estimated that 959 individuals would become certified as repairmen with a maintenance rating at a cost of \$3,600 each for a total cost of \$3.5 million; while the final rule estimated that 3,963 individuals would become certified at an average cost of \$2,816 each for a total cost of \$11.2 million. Included in the 3,963 are some who may have taken the repairman course with an inspection rating because they owned existing aircraft, but who take the second course when they later replace their aircraft with a new factory-built aircraft.
- The NPRM estimated that 951 individuals would seek a repairman to perform annual condition inspections at \$100 and that there would be a total of 8,473 inspections over the ten year period incurring a total cost of \$847,300; while the final rule estimated that 13,710 aircraft would be taken for inspections at a cost of \$275 each and there would be a

total of 57,370 inspections over the ten year period incurring a total cost of \$15.7 million. Some of the 13,710 aircraft that are taken for inspection are owned by individuals who originally acquired an inspection rating but then purchased new factory-built aircraft and decided that rather than obtain a maintenance rating they would take their aircraft to an appropriately certified repairman.

XVII. Appendix I – Definitions

powered parachute	<u>Powered parachute</u> means a powered aircraft comprised of a flexible or semi-rigid wing connected to a fuselage so that the wing is not in position for flight until the aircraft is in motion. The fuselage of a powered parachute contains the aircraft engine, a seat for each occupant and is attached to the aircraft's landing gear.
weight-shift-control	<u>Weight-shift-control aircraft</u> means a powered aircraft with a framed pivoting wing and a fuselage controllable only in pitch and roll by the pilot's ability to change the aircraft's center of gravity with respect to the wing. Flight control of the aircraft depends on the wing's ability to flexibly deform rather than the use of control surfaces.
gyroplane	means a rotorcraft whose rotors are not engine-driven, except for initial starting, but are made to rotate by action of the air when the rotorcraft is moving; and whose means of propulsion, consisting usually of conventional propellers, is independent of the rotor system.
airplane	Airplane means an engine-driven fixed-wing aircraft heavier than air, that is supported in flight by the dynamic reaction of the air against its wings.
airship	means an engine-driven lighter-than-air aircraft that can be steered.
balloon	means a lighter-than-air aircraft that is not engine driven, and that sustains flight through the use of either gas buoyancy or an airborne heater.
glider	means a heavier-than-air aircraft, that is supported in flight by the dynamic reaction of the air against its lifting surfaces and whose free flight does not depend principally on an engine.
experimental light-sport aircraft	Aircraft issued an experimental certificate under §21.191 (i) – ELSA
special light-sport aircraft	Aircraft issued a special airworthiness certificate in the light-sport category (or, aircraft issued a special airworthiness certificate under §21.190) - SLSA
consensus standard	<u>Consensus standard</u> means, for the purpose of certificating light-sport aircraft, an industry-developed consensus standard that applies to aircraft design, production, and airworthiness.

DAR	Designated Airworthiness Representative
DPE	Designated pilot examiner